

# The Iron Age

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## A Review of the Hardware, Iron and Metal Trades.

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### A Large Slotting Machine.

In order to meet the increasing demand for ponderous and heavy machine tools, the Hewes & Phillips Iron Works, of Newark, N. J., have designed a series of tools especially adapted for heavy forge, marine and railway equipment shops, the slotting machine illustrated in the cut being one of that number. The machine shown will take a piece of work 54 inches high from the table, and will swing 12 feet diameter from the center of the tool to the face of the upright. The cutter-bar is moved by a V rack and pinion of steel, driven by their well-known worm-gearing device. The machine is driven by 1½-inch wide belts, separately shifted, having a speed of 130 to 1 of the tool. The weight of the bar is overbalanced, so that any backlash of gearing is avoided, the strain being always in the same direction. To avoid wear of the accurately wrought surfaces of the bar and its attendant gib, it is lubricated by an oil-cup on top of the bar, which oils the eight surfaces continuously, and in such a manner as to entirely exclude dirt and grit. The stops or dogs for working the feed shifting devices are attached to the tool-bar, sliding in a dovetailed groove in the center of its face, their size and weight necessitating their being worked by a rack and pinion on the side of the cutting-bar. The feed is entirely independent of the shifting device, although worked from opposite ends of the same stop. The feed always takes place on the upper end of the stroke, and requires a movement of only 3 inches of the bar. This is not an easy problem when the load to be moved may be 20 tons. The cutter-bar guide has a vertical adjustment of 30° to accommodate work of different height. This is accomplished by means of two screws and cross-shaft, within convenient working distance of the door. The table, which is circular and pierced with T-slots, has power movements in six directions, which can be changed at will without stopping the cut, every movement of the feeding or shipping devices being within easy reach. The tool-holders for both inside and outside work are self-relieving on the upper stroke, avoiding the necessity of dragging the cutting edge of the tool over the work. When working a cut not requiring the circular motion, the table can be clamped fast and solid at the four corners of the cross-slide, securing it against the possibility of a change of auger, and relieving the circular gibbed surface entirely from the strain of the cut. The belt-slipper can be worked by hand from a lever on the side of the machine in full view of the cutting tool, making it especially convenient in starting a cut or setting a tool, the man operating the machine having a full view of every movement. The frame of the machine is in two pieces bolted together on the plane of the carriage. The upper frame is under-gibbed to the lower piece, and steel keys are driven in the back of the gib, so that in order to spring this joint it would have to tear the tongue of metal 6 inches thick extending entirely across the face of the upper frame. The sliding surfaces of the carriages and tool-bar are all at right angles to each other, so that the pressures on all surfaces are normal to those surfaces.

### Decisions on Re-Issued Patents.

A decision was rendered by the Supreme Court of the United States at Washington, on the 14th inst., in the patent case of Alexander Cochrane and others, appellants, vs. the Badische Anilin and Soda Fabrik. Appeal from the Circuit Court for the Southern District of New York. This was a suit in equity brought by the Badische Anilin and Soda Fabrik, a corporation organized under the laws of the Grand Duchy of Baden, against Alexander Cochrane and others, for the alleged infringement of a reissued patent granted April 14, 1871, to Charles Graebe, of Frankfort-on-the-Main, and Charles Liebermann, of Berlin, for "an improvement in dyes or coloring matter from anthracine." The court holds that if the claim of the patent is construed so broadly as to cover the defendant's article, it is wider in its scope than the original actual invention of the patentees, and wider than anything indicated in the specifications of the original patent. If the claim is construed so as to cover only the product which the process described in it will produce, it is not shown that the defendants' article is that product or can be practically produced by that process. The decree of the Circuit Court is therefore reversed and the case remanded, with directions to dismiss the bill of complaint. Opinion by Justice Blatchford.

The court also rendered a decision in the patent case of the Turner & Seymour Manufacturing Company, appellant, vs. the Dover Stamping Company. Appeal from the Circuit Court for the District of Connecticut. This was a suit brought by the Dover Company against the Turner & Seymour Company, for alleged infringement of a reissued patent on an improved form of egg-beater. The court holds that the reissued patent is void because its claims are broader than those of the original patent, and were made broader simply to maintain a monopoly which was desired, but which the claims of the original patent did not secure. The decree of the Circuit Court is reversed and the cause remanded, with directions to dismiss the bill. Opinion by Justice Matthews.

LARGE SLOTTING MACHINE, BUILT BY THE HEWES & PHILLIPS IRON WORKS, NEWARK, N. J.

led by their disagreeable experience to attack the entire system of patent laws will score a victory.

**Selangor Tin-Mining Company.**—The Shanghai papers contain reports of the first annual meeting of the Selangor Tin-Mining Company, of Shanghai, lately held in Shanghai. The company was formed in August, 1882, to work a concession of 1000 acres of land in the Malay Peninsula. Three years are allowed for making selections of four blocks of land of 250 acres each, and hitherto the directors appear to have been largely occupied in testing the metallic richness of the land, by boring and in other ways, before making the final selections. So far only one block has been definitely taken, and clearings, the construction of drains, of the necessary buildings and the preliminary excavations have been commenced. The requisite machinery and smelting appliances have been ordered, and the directors hope to enter the market with a supply of tin early this year. A line of railway is being con-

solving that a convention of the States should be held at the earliest possible date to suggest amendments to the Federal Constitution to remedy the dangerous tendencies toward the usurpation of power. The following is the full text of the resolutions:

**PROPOSED AMENDMENT TO THE CONSTITUTION.**  
*Whereas,* The Supreme Court of the United States, in a decision bearing date of March 3, 1884, in what is commonly known as "The Legal-Tender Case," declares that Congress possesses a "sovereign" power to constitute paper money a legal tender in the payment of debts; and

*Whereas,* That court declares, in said decision, that Congress is the sole authority to determine what laws are "proper and necessary" for giving effect to certain very broad and general purposes described in the Constitution of the United States, as "to provide for the common defense and general welfare of the United States, and to regulate commerce among the several States;"

*Whereas,* Said court declares that it has

Congress is so far made a sovereign power, irresponsible to the people, and the people are deprived of that sovereign control over the acts of their delegated representatives which it was the intention of the Federal Constitution to guarantee unto them.

*Resolved,* 2. That, in view of these revolutionary tendencies of said decision, and of the peril in which the political rights of the citizen and the reserved rights of the States are thereby placed, we do hereby declare it to be the conviction of the Senate and Assembly of this State that a convention of the several States of the Union should be held, at the earliest convenient opportunity, to consider what amendments to the Constitution of the United States may be properly adopted to remedy these dangerous tendencies toward the perversion and usurpation of power.

The sales of Government land during the past year, says the *Bulletin*, were by far the greatest ever made in a single year, amounting to 16,830,455 acres. The highest point

ever reached before was in the previous year, when 12,500,000 acres were disposed of. Only once before did the sales reach 9,000,000 acres, so it will be seen that the sales of last year were entirely unprecedented. The most of the increase was in Dakota, where 6,689,595 acres were disposed of. The States of Nebraska, Minnesota and Oregon rank next in the list of big land sales, while the Territory of Washington shows sales of nearly 1,000,000 acres. The greater proportion of these land transactions, it will be seen, are in the States and Territories adjacent to the Northern Pacific Railroad, and it is probable that much of the activity in this kind of property is due to the completion of that important line.

### South American Iron-Making.

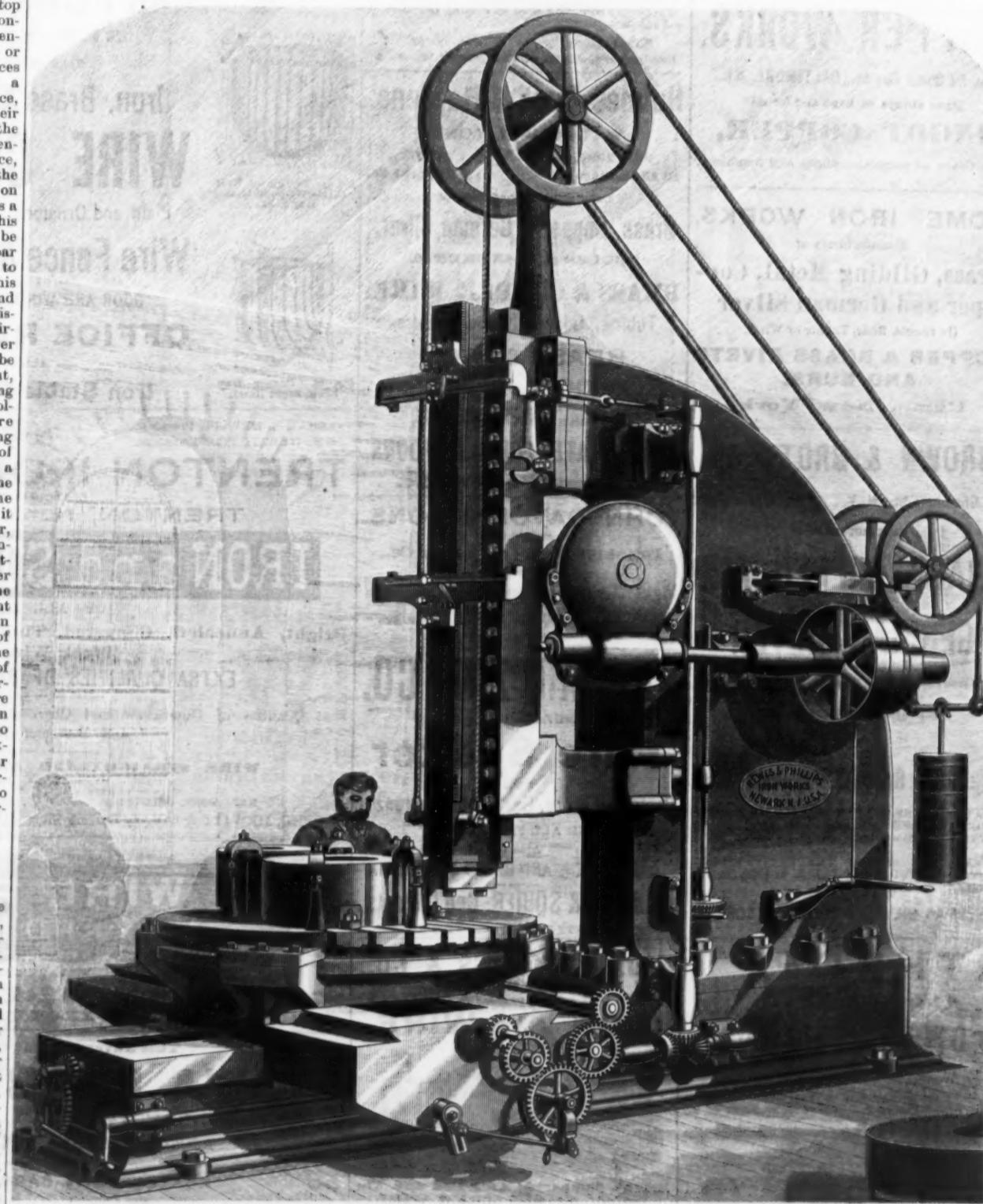
Mr. Thomas Hickey, of Pittsburgh, has recently returned from South America, where he was employed by the Government of Colombia in helping to establish a rolling mill in that country. He was one of six men for whom Mr. Martin, secretary of the Amalgamated Association, made a contract with the Colombian Government. The contract was for three years, the men to be paid so much per year, and also a percentage on the tonnage of iron produced. Mr. Hickey, previous to his going South, had been employed as a puddler in Shoenberger's mill. He quit Pittsburgh in the spring of 1880, leaving behind a wife and family, to lend his knowledge of the iron business to a country where blast and puddling furnaces were unknown. The attempt of the Colombian Government to establish a rolling mill was the first in the history of South America. Mr. Hickey states that large quantities of excellent ore are to be found in that country, and it is only a question of a short time until the business of iron-making will be followed with profit.

The mill at which Mr. Hickey was employed and helped to establish is located at Samaca, in the middle of a large iron ore district. The Government is exceedingly anxious to manufacture railroad iron in order to extend the railroad facilities in that country. Already a blast furnace and puddling furnaces have been started with a train of small rolls. A few English operatives are also employed by the Government, and the work of completing the mill, in order to manufacture all kinds of iron, is being pushed as rapidly as possible. What is most needed there, says Mr. Hickey, is a practical chemist who understands mixing. This would enable them to get along faster and with more certainty of success, as that knowledge is not possessed by operatives.

The *Engineer* states that the world's average product of sulphur is about 280,000 tons, of an average value of 109.20 lire per ton = 30,793,000 lire, or over £1,200,000. Of this total, Sicily produces 242,000 tons. There is an export duty of 11 lire per ton on sulphur, and the average export is 216,000 tons. The Sicilian sulphur is mostly exported raw, as it comes from the kilns. It is of seven qualities, the values varying from 101 to 115 lire per ton. Except in the better-worked "solfare," the separation of the sulphur from the earth in which it is contained is still conducted in Sicily by means of kilns (calcunori), which do not require any additional fuel, but which entail the consumption and loss of about one-third of the sulphur itself. About 18,000 hands are employed in the Sicilian "solfare," of whom about 14,000 work in the interior of the mines, including those employed in the transport of the ore to the surface. The sulphur in many mines is still carried to the surface on the backs of boys called "carusi," of whom there are about 3500.

Arrangements have been made by the British Board of Trade and the lighthouse authorities for a further reduction of 10 per cent. in the rate for light dues now levied on shipping. The effect of this reduction, which was to go into operation on the 1st inst., will be to increase the present abatement from 60 per cent. to 70 per cent. of the amount which was leviable for light dues when the control of the Mercantile Marine Fund was first placed in the hands of the Board of Trade in 1853. The shipowners will thus, in addition to further substantial relief which has been given to the home trade and to certain over-sea voyages, have to pay less than one third of the rate leviable in 1853. The present remission of light dues will probably exceed \$500,000 per annum.

A novel as well as interesting piece of engineering work has recently been accomplished at Bristol, England, which consisted in the moving of a foot-bridge 134 feet in length, bodily, down the river a considerable distance. The pontoons by means of which the bridge was floated to its new position consisted of four 80-ton barges, braced together so as to form one solid structure 64 feet in width, and were placed in position soon after the tide commenced to rise. At 6 o'clock a.m. the top of the stages, which was 24 feet above the water, touched the under part of the bridge, and in a quarter of an hour later both ends rose from their foundations. When the tide had risen four feet the stage and bridge were floated to the new position, when at 8.30 the girders dropped on to their beds.



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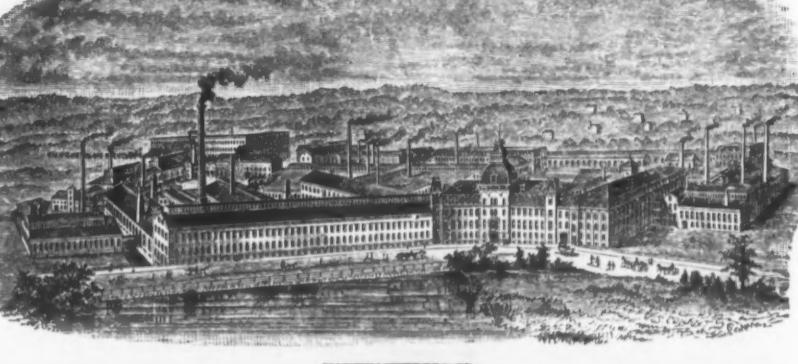
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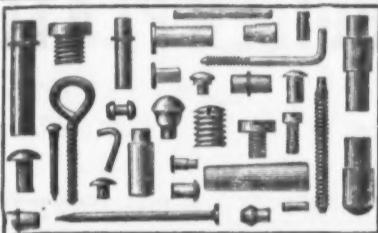
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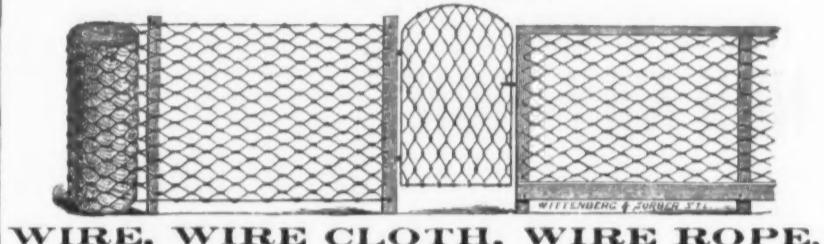
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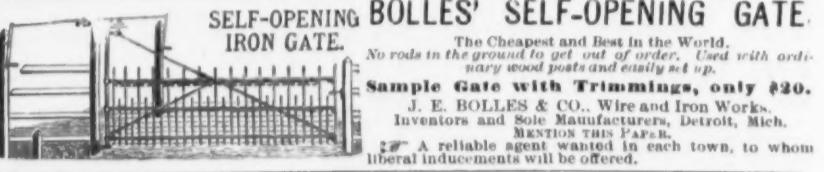
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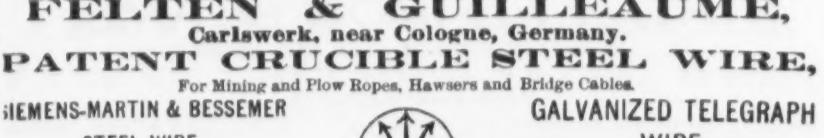
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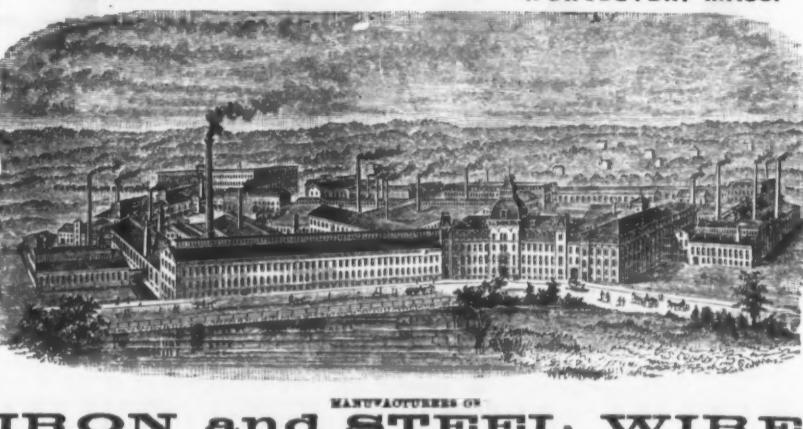
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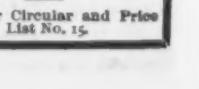
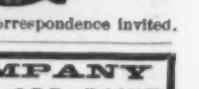
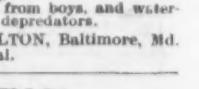
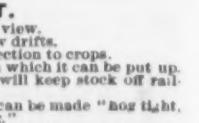
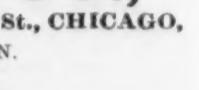
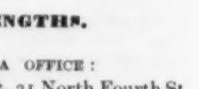
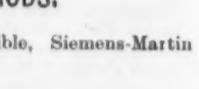
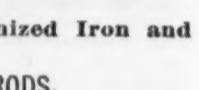
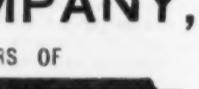
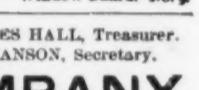
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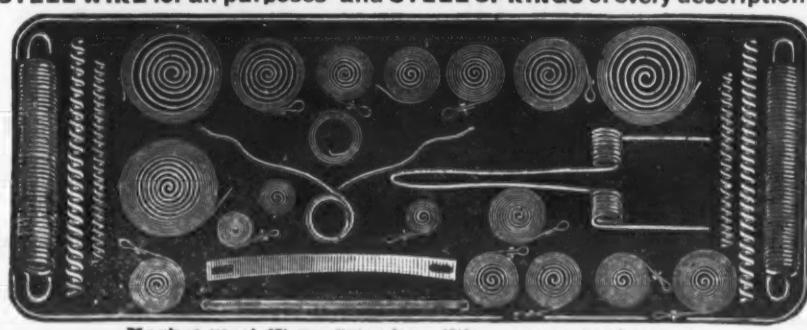
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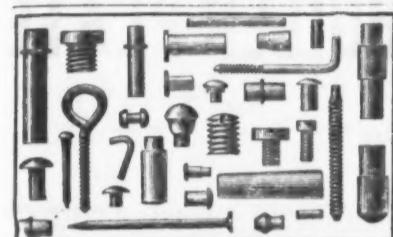




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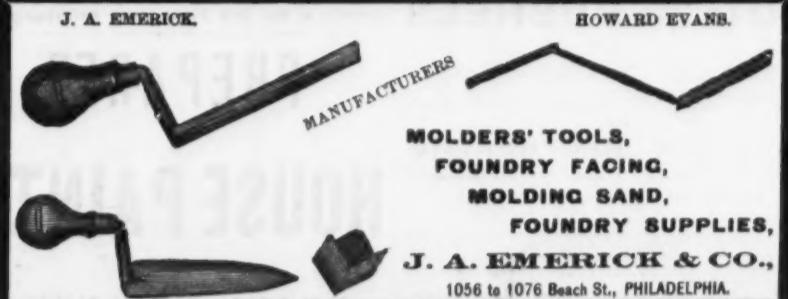
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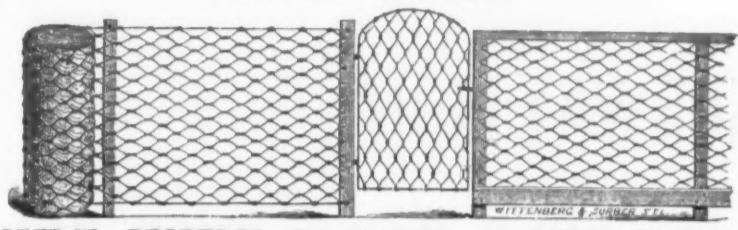
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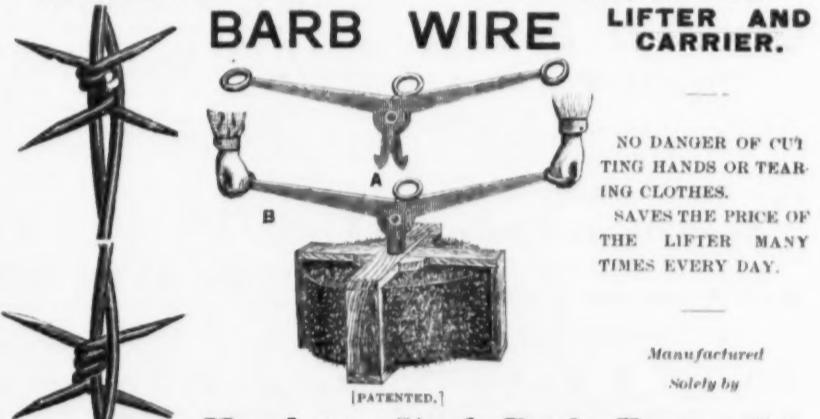
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**NEW INVENTIONS.**

### NEW INVENTIONS.

The Pneumatic Pulverizing Company, of New York City, have patented a new method for eliminating sulphur or other objectionable elements from ores. The ores are first pulverized and then subjected to the action of highly superheated dry steam, chlorine or other vapors or gases under pressure. Two or more opposing currents of such vapors or gases are used, and the apparatus is so constructed that the currents will charge themselves with the granulated ore, and will carry and propel the same against each other at a focal point within a retort. This retort is heated by a furnace sufficiently to raise the temperature of the materials treated and carry out the process of desulphurizing. After this the combined volumes are discharged through a pipe into reservoirs prepared to receive them.

A new hollow metal handle for table cutlery has been patented by S. E. Jerauld and E. R. Lawton, of West Cheshire, Conn. The blank is made with a taper, and two lips are formed at the butt end. The edges are then bent over and soldered to form the tube, which is then flattened into the ordinary knife-handle shape. Finally the lips are bent edge to edge and soldered together, thus closing the but and completing the article. For making more expensive goods a piece of brass tubing is used in place of the blank.

A tuyere pipe-support to hold and get the pipe out of the way of a tuyere to be inspected and worked with has recently been patented by F. W. Gordon, of Pittsburgh, Pa. The pipe is provided with and supported on trunnions, and adapted to be turned into a horizontal position above the plane of the tuyeres. Being fairly balanced, the operation requires but little labor, and there is no sudden falling back of the heavy pipe, as usual upon release of the supporting devices. The horizontal position of the pipe leaves a clear space for working at the tuyeres. Before the pipe can be turned a clamp-screw must first be loosened.

An apparatus for scaling and pickling metal plates, recently patented by H. and H. B. Chess, of Pittsburgh, Pa., is designed to provide easy means for handling and transferring the material while being treated. The acid tanks, fresh-water tanks and the live-water tank are rigidly clamped together and constitute a complete set for scaling, rinsing and neutralizing. The apparatus provides for the removal of the sheets in bulk from a wagon directly to the successive acid and rinsing tanks, with automatic agitation in them all, which will first clean the metal of the scale and then of the acid. The sheets are then, after coming out of a stationary steam drying-box, deposited on a wagon similar to that from which they were taken, and are now in a position to be readily handled in subsequent operations.

A soldering iron in which the soldering "copper" or iron may be readily adjusted and held at different angles to the handle has been invented by W. B. Choate, of Aurora, Ill. The soldering copper has a ball on one end which enters between two jaws of a bifurcated spring handle. A ring slides over the jaws of the handle by which they are pressed together and held against the soldering copper. By sliding the ring back the copper is released. The jaws are shaped in such a manner that the ball rests snugly between them.

The patent right to a wire bale tie has been assigned to J. L. Clark, of New York City. This tie is formed of a double wire twisted together, and turned first upward and backward to form the hook, and then forward, downward and backward to form a brace. When a strain is applied to the tie it is impossible for the loop on its engaging end to escape from the hook, because it would first have to be moved backward in order to be freed from the seat. The brace is passed through the loop, and is thus supported in such a manner that the hook cannot be straightened out.

A metallic custom-house seal is patented by E. J. Brooks & Co., of New York City. It consists essentially of a sheet-metal strip having a cup-shaped depression near one end for retaining a soft lead seal. At its other extremity the strip has an anchoring projection which, when the strip is folded, passes through a threading-hole and fastens in the lead. The lead is further provided with a central detective aperture in its top or face to expose the anchoring projection and show the construction of the seal, thus making it difficult to counterfeit.

An improvement in the checker-work for regenerator furnaces consists in making the ends of the bricks conical or pointed at their right and left ends. In this way an increased surface of irregular form is obtained. This surface breaks or divides the currents of gas or air, and affords a larger absorbing or radiating surface, by which the air or gas is more thoroughly heated. It is claimed that the force of the currents of air and gas are retarded in less degree, and the bricks are less liable to be cut and injured by the currents of heat. W. Swindell, of Allegheny, Pa., is the patentee of this improvement.

An alloy for coating sheet metal and wire without pickling consists of lead, zinc, tin and borax or borate of soda. The compound is formed by melting the several metals together, and then thoroughly intermingling the borax therewith. The alloy is spread, rubbed or pressed into the article to be coated, and forms a coating sufficient to protect the iron from oxidation. The inventor is J. H. Legge, of Pittsburgh, Pa.

A novel mode of producing clean surfaces on iron or steel, which renders the metal less liable to subsequent oxidation than with the ordinary finish, has been patented by L. D. York, of Portsmouth, Ohio. A loop or thick mass of the metal is subjected, at a high temperature, to a rapid succession of alternate bendings in opposite directions by passing it through rollers arranged to induce that effect. Simultaneously streams of water are thrown on the surface, and immediately thereafter the metal is subjected to reducing rollers. The chilling effect of the water detaches the scales. The reduction in thickness and in temperature follows so rapidly that further oxidation does

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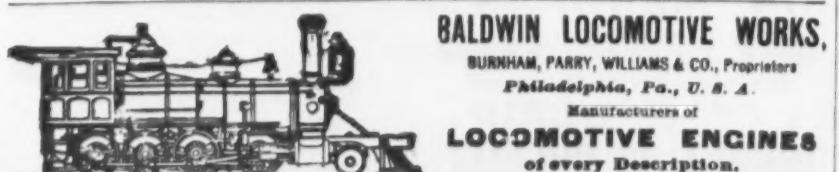
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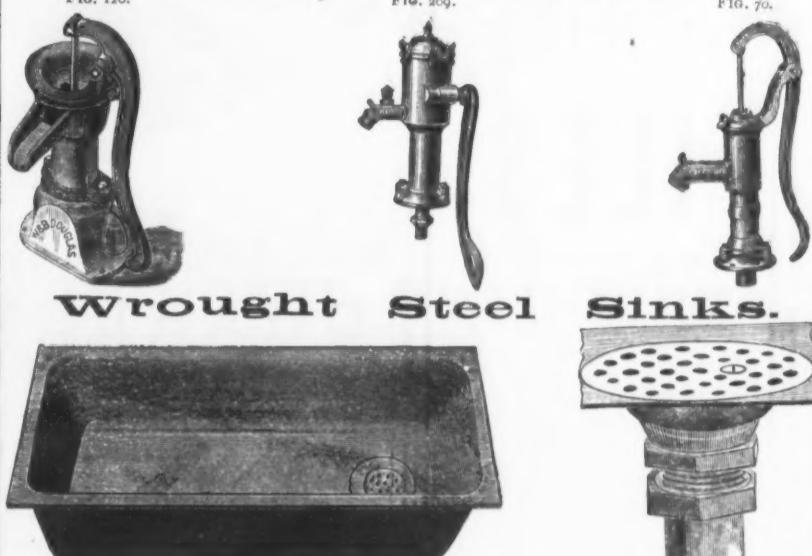
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FIG. 120.

FIG. 209.

FIG. 70.



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not occur, and, by the action of smooth rollers for the reducing rolls, surfaces are produced on the finished metal which are unusually perfect. The metal, it is claimed, will be almost entirely clear of the common black oxide which is present on iron and steel as ordinarily rolled.

voted to the names and addresses of firms and individuals who are using the machines made by this company. About 500 names are given, and they come from every manufacturing section of the United States.

The Brown & Sharpe Manufacturing Company.

The new catalogue issued by the Brown & Sharpe Manufacturing Company, Providence, R. I., while perhaps lacking the attractive character of many other publications of this general nature, will be found to meet its purpose equally well, being in compact form, fully indexed, and containing numerous illustrations of the various appliances turned out by them. The different machines and tools represented in the catalogue are manufactured with the intention of having combined in each respectively all those qualities best adapted to serve the uses for which they are designed. Every machine is subjected to inspection in detail—and, when deemed requisite, of actual operation—before being shipped. For the convenience of those desiring to purchase their milling and grinding machines and other machine tools, the company have placed a line of samples of these tools at No. 14 Dey street, New York, with Mr. E. P. Bullard, who will act as their agent in this city.

#### The Ball Engine.

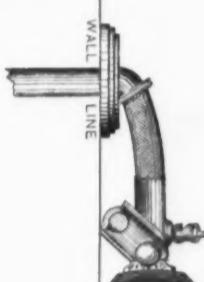
Mr. W. M. Allaire, 59 Liberty street, New York, agent for the Ball Engine Company, Erie, Pa., has lately sent us one of their 20-page catalogues, fully illustrated throughout with engravings of speed diagrams and different views of their engines, together with details. The descriptive parts will be found of interest, as giving an idea of the advantages claimed for the engine, and, together with tables of dimensions and price lists, furnish matter of some value to those contemplating the purchase of an engine.

#### The Korting Condenser.

A number of interesting tables enabling a ready calculation of the quantity of condensing water required per minute in cubic feet for the Korting condenser are submitted in a pamphlet recently issued by Mr. A. Aller, 109 Liberty street, New York. It contains, also, a price list and table of capacities, together with directions for connecting and operating the condenser. The condensing water tables, one of which was published in a recent issue of Mechanics, will be found exceedingly convenient and valuable, and those interested should, consequently, not fail to procure one of the catalogues.

Mouthpiece for Flexible Speaking-Tube.

Those who have occasion to employ speaking-tubes leading from a central office to various departments in an establishment frequently find it necessary, on the score of convenience, to employ flexible tubes for



Mouthpiece for Flexible Speaking-Tube.—  
Fig. 1.—The Barlow Speaking-Tube.—  
Mouthpiece at Rest.

terminals, especially when they occur near a desk. The flexible tubes are readily arranged in such a way as to make it possible to draw any one of them to the mouth of the speaker, and thus save the necessity of rising. Wherever such an arrangement of tubes is made, the question of the whistle and form of mouthpiece is an important consideration. The ordinary whistle which turns in the neck of the mouthpiece and is held in place by a spring answers very well, so far as sounding an alarm is concerned. The little indicator, however, usually accompanying this form of mouth-piece be-

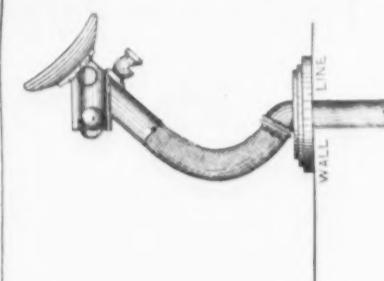


Fig. 2.—The Mouthpiece Raised for Use.

comes inoperative on account of the tube hanging down. Accordingly, there is a necessity of some different arrangement of parts in order to secure an automatic indicator. An objection to the ordinary whistle which turns up out of the way when the tube is used for speaking is the fact that both hands are required whenever the tube is used—one to hold the tube near the mouth, and the other to turn the whistle away. An automatic arrangement in combination with an indicator would, therefore, seem to be very desirable. The points to be gained are such an arrangement of parts as will indicate the tube through which the sound has come and which will be out of the way when the tube is lifted up, and which in



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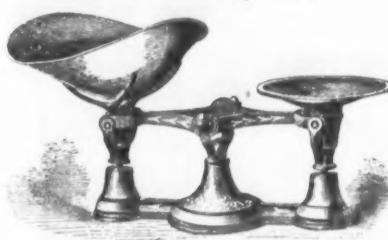
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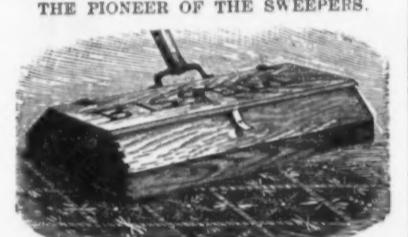
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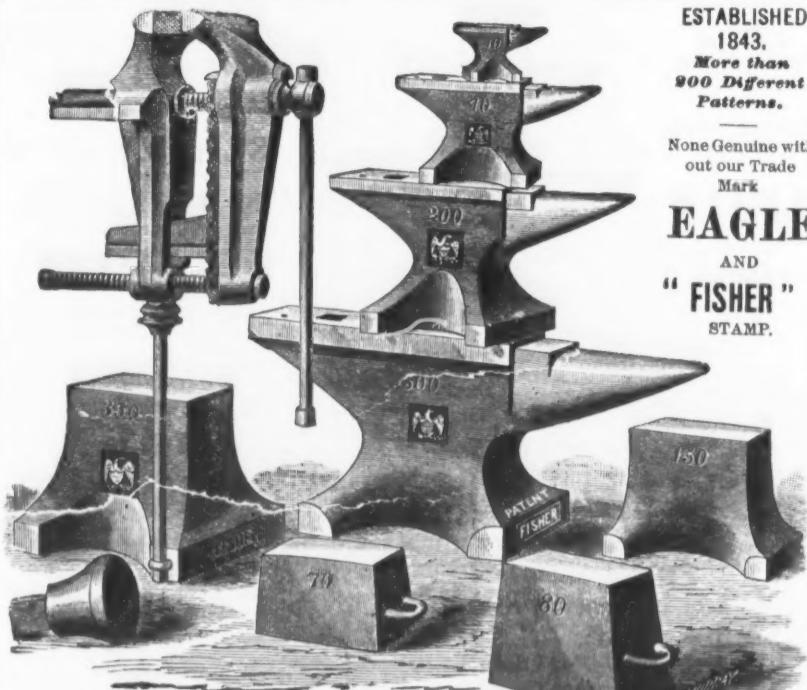
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900 Different  
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turn will automatically restore themselves to proper position for another alarm the moment the tube is dropped.

In the accompanying engravings we show what is known as Barlow's patent speaking-tube fittings, manufactured by T. Barlow &amp; Co., of Queen street, London, England, and which, so far as we can judge from the manufacturers' descriptions, meet in most respects the conditions which we have been describing. We are under the impression that there is nothing in our home market equally serviceable. We base this remark upon the fact that we investigated the supply very carefully a short time since in fitting up such an arrangement of speaking-tube fittings as we have above described, and much to our surprise, we found nothing that answered these requirements which was automatic in character. One speaking-tube fitting usually found in the common mouthpieces to work by gravity, and changed the hinge of the little flap which serves as an indicator in such a manner as to make these parts serve a fairly satisfactory purpose on a hanging flexible tube. However, we think the arrangement far less desirable for use than such a device as is shown in our engravings. The Barlow fitting, if it is possible, may be in this market, but, if so, we have failed to find it after careful inquiry.

Referring to the engravings, Fig. 1 shows the position of the parts when at rest. The whistle is at the side. A ball, by the action of gravity, falls down and covers the orifice of the mouthpiece. Accordingly, by blowing into the opposite end of the tube the whistle is sounded. The arrangement of the parts in the whistle is such as to cause an indicator to be thrown out, as shown in the engraving. When the tube is raised to the mouth, in order to answer back, the parts take the position in Fig. 2, the ball drops back into the cavity at the side specially designed for it, thus opening the tube for the purposes of communication. At the same time the indicator in the whistle drops back into position, to be driven out again whenever the tube is blown into from the opposite end. From this it will be seen that this device is entirely automatic. The whistle does not require special handling to be used, nor does the indicator require putting back. It obviates two well-known objections to other speaking-tube fittings in use.

thus enabled to study the best methods of annealing, and to find at once the degree of softness in an unknown specimen. Similarly, when we temper annealed iron and steel, we find that we can follow out each degree of temper up to molecular rigidity; and we may thus appreciate in an unknown specimen of unknown temper the degree of its hardness. We have thus in each piece of iron or steel a limit of softness or hardness. In soft Swedish iron, tempering hardens but 25 per cent. In cast steel, tempering hardens it 50 per cent. In cast steel, tempering hardens it 400 per cent., while mechanical compression gives but 50 per cent. Between cast steel and Swedish iron we find a long series of mild steel, hard iron, &amp;c., varying in their proportionate degree between the two extremes just mentioned. The theory which the author has advanced, of molecular freedom as in soft iron, and molecular rigidity as in cast steel, fully explains all the changes which we are enabled to perceive and measure; but it is not absolutely necessary to accept the theory in order to appreciate the results. For, leaving theoretical considerations aside, we have one proved fact, viz., that the magnetic power or capacity of a piece of iron, under the influence of an external limited magnetizing power, depends upon its softness; and that the retention of magnetism, when the external power is withdrawn, depends upon its hardness. The same degree of temper or annealing upon the same iron or steel gives invariably the same reading; but the slightest change, say, from a straw-colored temper to a blue, gives very wide differences.

*Influence of Annealing upon the Molecular Structure of Iron and Steel.*—The magnetic balance shows that annealing not only produces softness in iron, and consequent molecular freedom, but it entirely frees it from all strains previously introduced by drawing or hammering. Thus a bar of iron drawn or hammered has a peculiar structure, say a fibrous one, which gives a greater mechanical strength in one direction than another. This bar, if thoroughly annealed at high temperatures, becomes homogeneous in all directions, and has no longer even traces of previous strains, provided that there has been no actual mechanical separation into a distinct series of fibers.TABLE I.—*Influence of Annealing upon Swedish Iron, Sample G.*

	Approximate temperature.	Degrees of softness indicated upon the magnetic balance.
Wire, hard-drawn, as furnished by makers.	Cent.-Fahr.	230°
Annealed at black heat.	500°	950°
" dull red.	700°	1,300°
" bright red.	1,000°	1,500°
" yellow.	1,100°	2,000°
" white.	1,300°	2,300°

From Table I we see that a regular increase of softness occurs as the temperature at which Swedish iron is annealed increases, the maximum being at a point under that of fusion. The results of the author's researches may be thus formulated: 1. The highest degree of softness in any variety of iron or steel is that obtained by a rapid heating to the highest temperature less than fusion, followed by cooling in a medium incapable of changing its chemical composition. 2. The time required for gradual cooling varies directly as the amount of carbon in alloy. Thus in absolutely pure iron rapid cooling, as in tempering, would not harden it, while steel might require several hours or days, even for pieces only 1 mm. in diameter. Slow cooling has no injurious effect upon iron when cooled in a neutral field; consequently, where time is no object, we may employ slow cooling in every case. A wire or piece of iron thoroughly annealed must not be bent, stretched, hammered or filed; the hardening effect of a bend is most remarkable, and the mere cleaning of the surface by sandpaper hardens that surface by several degrees on the scale.

*Tempering.*—The influence of tempering upon the magnetic retentivity or molecular rigidity has been shown in every piece of iron or steel yet examined. Swedish iron hardens but to 20 per cent. by tempering, while cast steel hardens 300 per cent., the molecular rigidity of tempered steel being 18 times greater than that of soft iron. The influence of different methods of tempering on crucible steel is shown in Table III, ranging from its ultimate molecular rigidity to its ultimate softness when annealed.

TABLE III.

Crucible fine cast steel tempered.	Mark.	Magnetic capacity.
Bright yellow hot, cooled completely in cold water.	A	28
Yellow red hot, cooled completely in cold water.	B	32
Yellow hot, let down in cold water to straw color.	C	38
Bright yellow, let down in cold water to blue color.	D	44
Bright yellow, cooled completely in oil.	E	51
Bright yellow, let down in water to white.	F	58
Red heat, cooled completely in water.	G	66
Red heat, cooled completely in oil.	H	72
Annealed.	J	84

Table IV gives the complete results of the mechanical, chemical and physical tests upon these wires. The tensile strength and electric conductivity are as furnished by Frederick Smith &amp; Co., the chemical analyses are as given by Mr. Henry S. Bell, and the magnetic capacities of the bright hard-drawn wires, as of the annealed and tempered wires, were determined by the author with the aid of the magnetic balance. Table IV will aid us in drawing several conclusions. Taken in conjunction with Table III, it shows: 1. That the degree of temper in cast steel is dependent jointly on the heat to which it is raised and the degree by which this is lowered in rapid cooling, the extremes in Table III giving the relative molecular rigidity of the softest and hardest steel. 2. That a peculiar mild and homogeneous temper is obtained in oil. 3. That the tempers or degrees of hardness when steel is let down through the various colors vary with the kind of steel tempered, as well as with the heat from which it has been let down.

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NOW, This, is to Witness, that, in consideration of the forbearance of the Representatives of the said John Wilson, to me for damages for the wrong aforesaid, I do hereby undertake and agree,

FIRST, to surrender and deliver to the Attorneys for the said John Wilson, all knives now on hand, and in my possession, or under my control, bearing the said imitation trade-mark, and

SECOND, I further undertake and agree to and with the said John Wilson, and his legal representatives, not to manufacture or sell, or cause to be manufactured or sold, at any time in the future, Knives or other Cutlery, bearing his trade-mark aforesaid or any imitation or simulation thereof. IN WITNESS WHEREOF, I have hereunto set my hand and seal at West Mansfield, aforesaid, this thirty-first day of May, 1883.

WITNESS—  
E. M. REED.  
(Attorney for Defendant.)

Imitation

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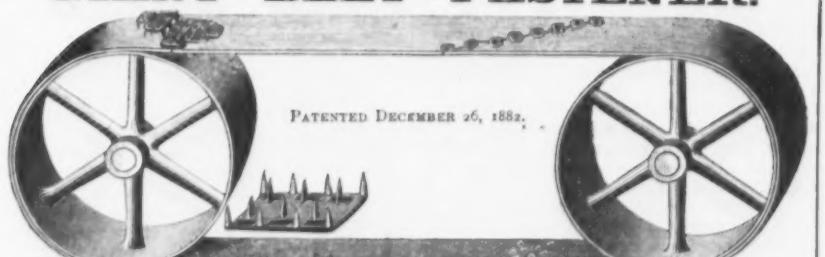
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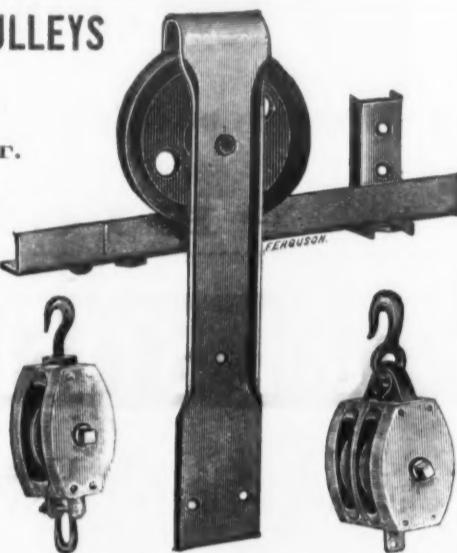
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In these experiments the author has noticed that the highest degree of temper has not been obtained with wires containing the relatively highest proportion of carbon.

the results presented we are dealing with proved facts. Another extraordinary relation of physical to mechanical tests may be mentioned. In Table IV the tensile strength bears no relation either to the magnetic or electric qualities. On increasing the electro-motive force in the magnetic balance all the readings became confused ; there was no longer any fixed relation as to the hardness, nor any other quality. But on again forcing the magnetism to a very high point, the figures for magnetic capacity were found to bear exactly the same relation to each other as those for tensile strength. This, however, may have been only an accident, as it only seems true at present in relation to the wires in Table IV ; but it gives hope that by a new method we may some day be enabled, not only to deduce electrical conductivity from magnetic capacity, but also tensile strength. Already in Table IV we notice a close relation between molecular rigidity, as indicated by the figures for the annealed wires, and tensile strength. The only exception is the wire H, but the cause of this is clearly the small difference between its capacity as annealed and tempered. Leaving aside all theoretical considerations and hoped-for improvements in the methods of observation, the author believes that he has demonstrated clearly that, by the aid of the instrument and methods described, we can at once determine the physical state of iron, as influenced by tempering and mechanical hardening, from the ultimate degree of softness to that of hardness ; that we can at once determine the best iron for electro-magnets, and the best methods of softening it, as well as the best steel for permanent magnets, and the best temper to be given to it. He therefore ventures to hope that the magnetic balance will prove an aid of no small value in all researches into the physical state of iron and steel.

**Bangbro Iron and Steel Works, Sweden.**

A late issue of the *Iron and Coal Trade Review* contains a brief description of the Bangbro Iron and Steel Works—one of the largest of their kind in Sweden—which are situated on the Frövi-Ludvika branch of the Central Swedish Railway. The foundry was entirely remodeled and modernized during the years 1872 to 1874, and is now equal to any demand that may be made upon it. The works are planned on the Belgian principle, and attached are cottages for the workmen, and a schoolhouse where gratuitous education for the children of the employees is provided at the cost of the company. There is also a hotel ; in fact, everything is done to insure the comfort and well-being of the workpeople and their families. To these works belong, among others, the famous iron mines of Ställberget, situated some 10 miles from the Bangbro Works. The plant consists of two blast furnaces—two more being under construction—three ore-roasting furnaces, an apparatus for the drying of charcoal, a Bessemer plant with two converters and blowing apparatus attached, a gas generator for heating the converters and different furnaces, besides machinery for casting and for making iron molds and effecting the repairs necessary in the works. There are also furnaces for smelting copper, of which a small quantity is returned every year. A network of railways connects the different departments of the establishment, which again, is directly connected with the whole of the Swedish railway system at the Bangbro terminus on the Frövi-Ludvika Railway. The works are capable of turning out nearly 10,000 tons of Bessemer pig per annum, besides 7200 tons of Bessemer castings. From the different mines belonging to the works there are raised, in all, about 20,000 tons of ore per annum. The results of the Bessemer pig operations during 1882 were approximately as follows : Bessemer pig returned, 900 tons ; numbers of shifts at blast furnaces, 728 ; average quantity of charcoal consumed in 24 hours, 94½ loads ; average quantity of pig iron returned, 23½ tons ; average quantity of iron added per cwt. pig iron, 9.11 ; percentage of ores after charging, 51.52 ; pressure of blast in lines of mercury, 16.20 (about  $\frac{1}{2}$  pound) ; temperature of hot blast, from  $210^{\circ}$  to  $300^{\circ}$  C. ( $482^{\circ}$  to  $572^{\circ}$  F.) The result of the Bessemer casting operations during 1882 were : Finest Bessemer castings, about 6000 tons ; number of shifts, 342 ; average number of blows per shift, 5.93 ; average manufacture of castings per shift, 15½ tons.

The "American Institute of Electrical Engineers" is the proposed name of a new society to be organized somewhat after the models of the three principal engineering societies now in existence in this country, and to advance in a general way the interests of theoretical and applied electricity. That there is an actual demand for an institution of this kind has unquestionably been felt for some time, and the "call" recently issued for the purpose of establishing the society, and already signed by a number of electricians and capitalists and others prominently identified with electrical enterprises, will, therefore, very probably meet with a hearty response. The call extends "an invitation to all those persons who are eligible to membership to meet in New York City, at a place to be announced hereafter, on Tuesday, the 12th day of May, 1884," and for all further particulars those interested are directed to apply to Mr. N. S. Keith, 237 Broadway, New York.

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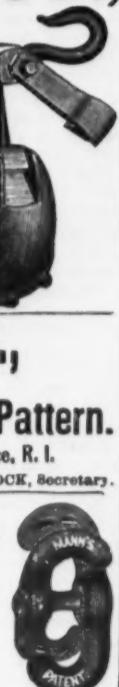
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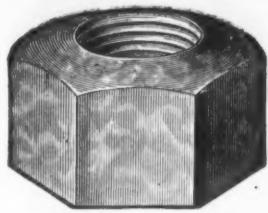
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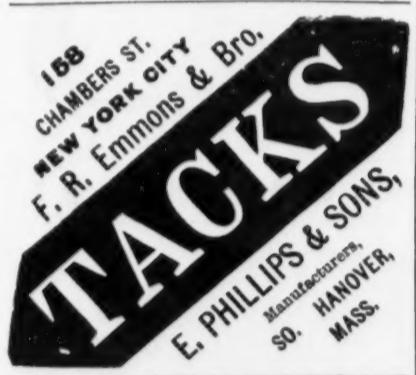
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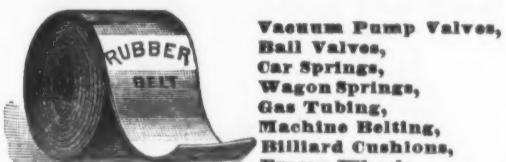
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Pat. July, 1873.

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Emery Wheel.

Patented.

Patented.

Section of Emery Wheel showing Iron Center.

LARGE WHEELS MADE ON CAST-IRON CENTER IF DESIRED.

The properties of these Wheels are such that they can be used with great advantage and economy for cutting, grinding and finishing wrought and cast iron, chilled iron, hardened steel, slate, marble, glass, etc. These wheels are extensively used by manufacturers of hardware, cutlery, edge tools, flour and feed mills, fire arms, wagon springs, axles, skates, agricultural implements, and small machinery of almost every description.

Pat. Jan. 26, 1860.

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B represents that part of the packing which, when in use, is in contact with the piston rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight, and yet creates but little friction.

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Pat. Jan. 26, 1860.

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Pat. July, 1870.

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### An Astonished Inspector.

The insurance companies, remarks the Milford Gazette, must have plenty of money. Every few weeks somebody comes in and looks our premises over, glances at the stove-pipes, smells the benzine bottle (sometimes with a disappointed face), and asks all sorts of questions. We do not grumble. We like to see people active, and are glad to discover that some people are impudent besides newspaper reporters.

One of them called at the Gazette office the other day. He looked up stairs and down, and found no fault till, peeking through a window from the composing room into the cellar, he discovered a small boiler surmounted by a steam gauge which registered a pressure of 115 pounds. He was evidently astonished, and inquired if we considered the boiler safe to use.

"Perfectly."

"You are running an unusual pressure. What is your safety-valve set on?"

"Don't know. Never examined."

"Has this boiler been tested recently?"

"Not that we know of."

"Do you always run that amount of pressure?"

"Usually."

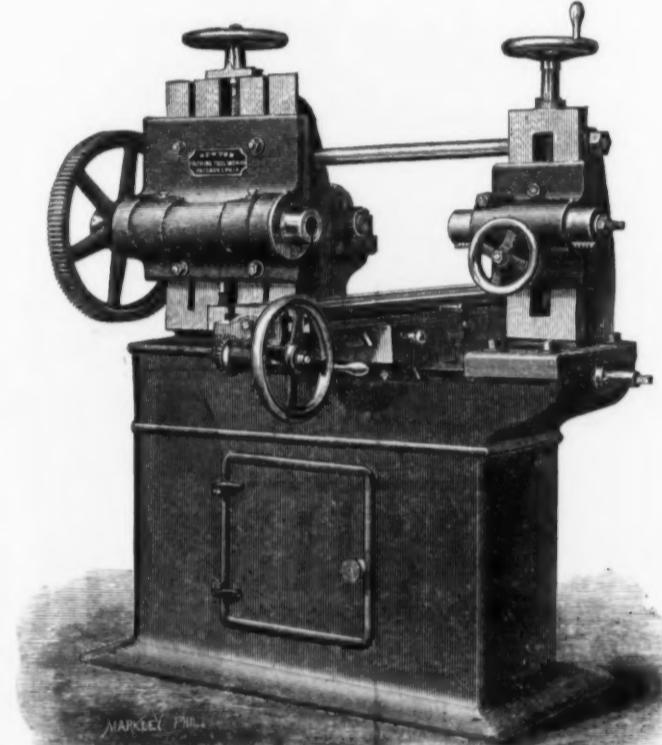
"You are running a great risk. Shall have to examine it at once. You are endangering the life of every person in the building. I must order you to reduce the pressure at once, and will see that the boiler is inspected."

We made no reply, but when that man examined the boiler and found that it was merely a shell which had not been fired up for half a dozen years, and that the "printers devil" had fixed up the steam-gauge in his spare moments, while waiting for copy, he said naughty words, which so shocked us that we have turned the gauge around, and the only person who can look at it is the boy who comes in to guess at the gas meter.

The Gazette runs its presses by a water motor.

### A New Milling Machine.

We illustrate in the accompanying engraving the No 3 New Pattern milling machine built by the Newton Machine Tool Works,



NEW PATTERN MILLING MACHINE.

of 2341 Callowhill street, Philadelphia, Pa., and which has taken the place, to a large extent, of what is familiarly known as the "Lincoln" pattern, the adjustment being much more simple and accurate and the machine much heavier and stronger. No. 1 is intended for sewing-machine works and other establishments of a similar nature, and has a carriage 30 inches long, with a vertical adjustment of spindle of 10 inches above the carriage, the latter being 8 inches wide. No. 2 is intended for a heavier class of work—for milling brasses for stationary engines, cutting keyways and for electric-light works. The carriage is 34 inches long, 9 inches wide, and the spindle has a vertical adjustment of 11 inches from the carriage. No. 3, which we show in the cut, is used principally by railroad shops, locomotive works, and to a great extent by builders of stationary engines. The machines of this size are very convenient, and are claimed to save from 50 to 100 per cent. on planer or shaper work, in milling cross-heads, rod brasses, splining shafts and various other operations. The workmanship of these tools is of the highest order, and the distribution of metal most perfect. For those desiring to reduce the cost of their product they are of unquestionable value. They are heavy and well proportioned and fitted, and a cut can be taken at the rate of 1 1/2-inch feed per minute with a cutting speed of from 70 to 80 feet per minute.

**The Miantonomah's Plates.**—On March 20 Senator McPherson introduced a resolution into the United States Senate calling upon Secretary Chandler to furnish the Committee on Naval Affairs with the copies of the contract awarded for the furnishing of the sheet-armor plates and bolts for the turrets and pilot-house of the double-turreted monitor Miantonomah. The Secretary sent the committee the copies a few days ago, and the committee now have them under consideration. The contracts were awarded on November 13 last to John Brown & Co. and Charles Cammell & Co., Sheffield, England. Immediately after, Nathaniel McKay, the shipbuilder, who claims to have been desig-

nated by Charles Cammell & Co. as their agents in New York, made a demand upon them for a commission of 4 per cent. upon the contract, which he assumed he was entitled to, but which they denied. Mr. McKay has made a report to the committee upon the subject, stating what he assumes to be his position. He criticizes the awarding of the contracts, and asserts that the contractors are to receive at least 40 per cent. more than the materials will actually cost them to deliver. He says that when the facts come out they will be startling, but declines to give the nature of them in his report. Messrs. Wallace & Co., of New York, who acted as the representatives of the English firm in the negotiations, say they do not fear the most thorough investigation in regard to the contractors or the price promised, and that the plates will meet the fullest requirements.

### Trials with a Dynamite Gun.

The first of the regular series of experiments with the new pneumatic dynamite gun which is to be carried on during the spring at Fort Hamilton, in the harbor of New York, took place on the 16th inst., under the direction of Col. John Hamilton and Lieut. E. L. Zalinski. The gun was manufactured at the Delameter Works expressly for these experiments, at a cost of \$5000. The guns could be manufactured in large numbers for about \$1000 each. The gun consists of a long tube 40 feet in length and  $\frac{1}{2}$  inch in thickness. It is connected with a large steel cylinder or flask, which is supplied with compressed air from the compressed air steam engine. The target at which the shots were fired was situated, at a distance of 2100 yards, on the shore at Fort Wadsworth, the gun being placed on the glacis of Fort Hamilton. The first shot fired was one weighing 17 pounds, capable of carrying from 10 to 12 pounds of dynamite. It was loaded with the same weight of sand and lead, instead of dynamite. The pressure used was 485 pounds. The shot went 60 yards to the left and slightly above the target, exactly as Lieutenant Zalinski had foretold it would do, owing to the wind. The second shot, with a pressure of 480 pounds, went 10 yards to

the left of the target and 15 yards above it, burying itself completely in the hill. The third and last shot, which was sent in a blinding rain-storm, was a line shot, which went 25 yards short of the target and struck the water. "I am well satisfied with the experiments," said Lieutenant Zalinski. "While these dynamite guns can never supersede the ordinary powder guns, they will be a very valuable auxiliary, as they can be used equally advantageously on land or sea. The pressure used to-day—480 and 485 pounds—we shall increase to 2000 pounds as soon as another engine is supplied. The numerous attempts to throw dynamite with ordinary powder guns have nearly always met with disastrous results."

**Long Steel Rails.**—The Osnabrück Steel Works, Germany, have recently been manufacturing steel rails 88 feet 6 inches long, which have been laid down on railway bridges crossing the city of Hanover. It was found that the noise caused by passing trains was becoming such a nuisance that a remedy had become a necessity. The cause of it was the violent vibration at the rail joints, and the engineers hit upon the expedient of having rails made long enough to cover the whole length of the bridges. Since they were laid down the nuisance caused by the rail joints has ceased.

Diversified industries have had a great effect on the value set upon property in Chattanooga, Tenn. The papers there are quite enthusiastic over the sale for \$35,000 of a church property that was valueless except for its lot. Thirteen years ago, when it was presented to the church corporation, it was valued at \$1500, and ten years ago, according to the local papers, "would have been considered dear at \$2000." The iron and coal industries of Tennessee and around Chattanooga are being rapidly developed, bringing with them a rapid growth of population and a demand for land and farm products that give the Southern city something of Western dash and enterprise.

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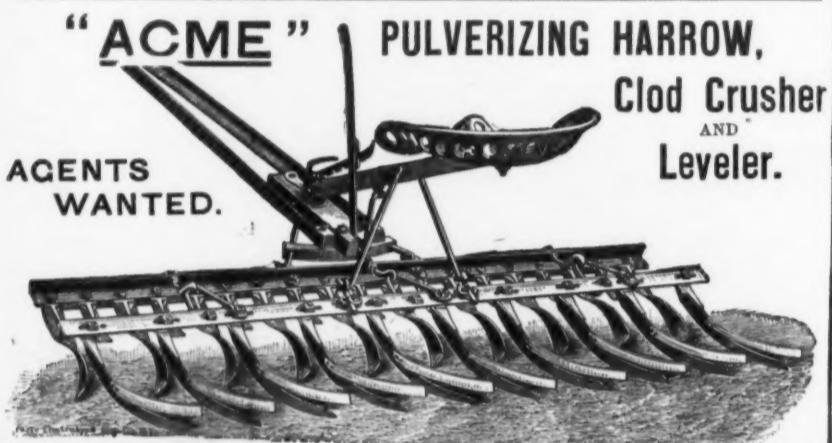


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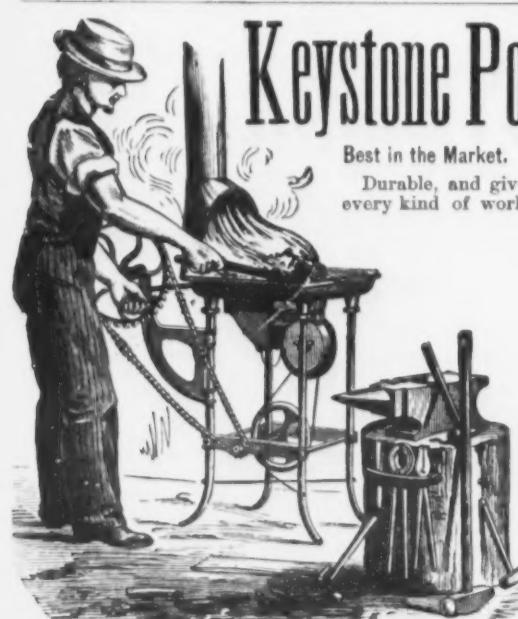
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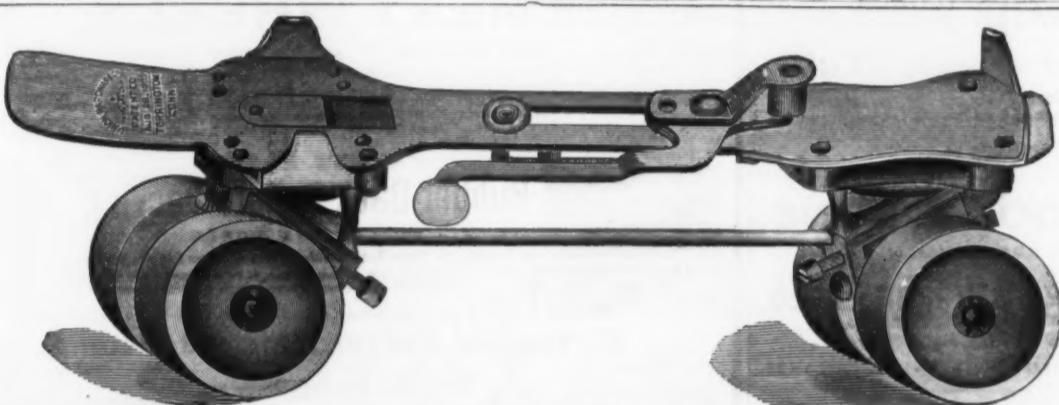
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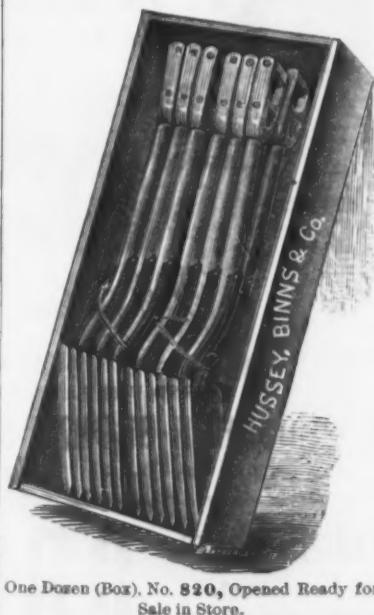
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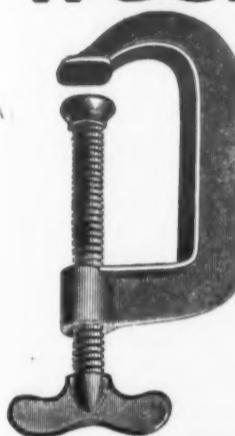
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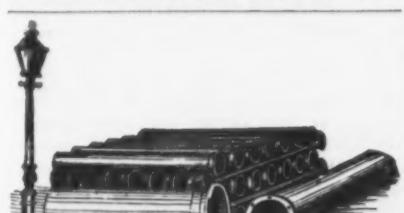
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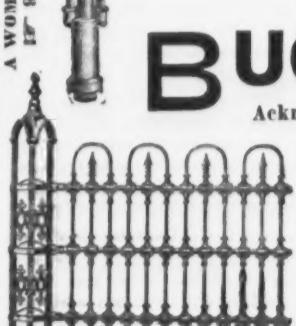
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### LATEST LEGAL DECISIONS.

SALE—AGREEMENT NOT TO CONTINUE BUSINESS—DAMAGES.

A sold out his business and the good-will thereof to B, and made a contract with B not to go into the same business in the vicinity for three years, "under a penalty of \$100," but he violated this agreement and A got an injunction against him, which was afterward dissolved. An appeal was taken in the case—Stafford vs. Shortreed—to the Supreme Court of Iowa, where the judgment was affirmed. Judge Rothrock, in the opinion, said: "It is to be presumed that the plaintiff made his contract with a full knowledge of defendant's financial standing and ability to discharge his obligations. If he had doubts upon that question, he should have required some security to protect himself against any damages which he might sustain by reason of the defendant's failure to observe his agreement. All he can have is the ordinary process of the law to enforce payment; he cannot have an injunction to restrain the defendant from doing business. The amount the defendant agreed to pay is in the nature of liquidated damages; it cannot be regarded as a penalty, because the actual damages here must, in the nature of things, be subject of mere conjecture; they cannot be established by evidence even approximately."

FAUDULENT CONVEYANCES—DEED RECORDED —STATUTE OF LIMITATIONS.

A creditor filed a bill in equity to set aside a voluntary deed to the debtor's wife as fraudulent as to him. The deed had been recorded for more than a sufficient time to bar the action by the statute of limitations, and the defense of the statute was pleaded. The trial court decided in favor of the plaintiff on the ground that the statute did not begin to run against him until he discovered the fraud. The defendant carried the case—Ward vs. Thomas—to the Court of Appeals of Kentucky, where this judgment was affirmed. The Chief-Judge (Hargis), in the opinion, said: "The recording of conveyances made in good faith and for valuable consideration within the time prescribed by the registry, the laws, is notice to the world of their existence and recordable contents; but where the conveyance is voluntary its registration is not constructive notice of its existence or contents to a subsequent purchaser for a valuable consideration without actual notice. A pre-existing creditor stands in a better position than a purchaser; he has the right to rely upon the condition of his debtor when his debt was created, and he is not bound to keep constant watch over the public records for the voluntary conveyances his debtor may make, else be barred by limitations, regardless of the time of actual discovery of the conveyance or its equivalent."

TRADE-MARK—FALSE LABEL OR TRADE MARK.

S. in Baltimore, sued A for infringing his trade-mark of "Angostura Bitters," alleging that A was imitating his trade-mark and labels in which he wrapped the bottles of his bitters, by putting up a compound, represented to have similar properties and virtues, in labels simulating those used by him. A showed upon the trial of the case—Siebert vs. Abbott—that the complainant's label had on it untruthful statements. The label was headed in three languages—Spanish, German and English—with these words: "Aromatic Bitters, or Angostura Bitters, prepared by Dr. Siebert at Angostura, now Port of Spain, Trinidad." It was proved that Dr. Siebert died in 1870, and that he never lived at Port of Spain, but that his successors, his sons, the complainants in this suit, moved to Port of Spain several years after his death. The court gave a decree which was not satisfactory to either of the parties, and both appealed to the Court of Appeals of Maryland, where the bill was dismissed because of the false statements in the label. Judge Irving, in the opinion, said: "The object of the trade-mark being to indicate by its meaning or association the origin or ownership of the article, it would seem that when a right to its use is transferred to others, either by the act of the original manufacturer or by operation of law, the fact of the transfer should be stated in connection with its use, otherwise a deception would be practiced upon the public, and the very fraud accomplished to prevent which courts of equity interfere to protect the exclusive right of the manufacturer. In this case there were substantial misrepresentations, and we cannot give the complainant any protection."

PARTNERSHIP—LETTERS PATENT AS ASSETS.

Two brothers were partners, and during their association one of them procured a patent and assigned it to the firm, who used it in their business. The inventor died, and in closing up the accounts refused to account for one-half of the profits of the patent, under the claim that the patent was not firm property, but that each of the firm was a half owner thereof. The personal representative claimed that the patent was a firm asset, and that the surviving partner should account for all gains, even those acquired after the dissolution of the firm. In this case—Freeman, administratrix, vs. Freeman—the Supreme Judicial Court of Massachusetts decided in favor of the administrator. Judge Charles Allen, in the opinion, said: "Letters patent belonging to a firm are to be dealt with, on a dissolution of the firm, like other partnership property. That which was partnership property before the dissolution continued to be so afterward, and a sale of the whole personal property will ordinarily be enforced by a court of equity, and an account ordered of profits made since the dissolution. The surviving partner is not allowed to divide this property in specie, or to take it himself at a valuation, or to have its value ascertained otherwise than by a sale, but he must turn all the assets into an available or distributable form, so far as this can be done."

SALE—DELIVERY—PRICE NOT FIXED.

Goods were delivered to A by B under a negotiation of sale, and B said to A when the goods were taken, "Now the goods are yours." A exercised ownership over the property, selling them in his store in the usual way of business on the day after he received them. The prices were not fixed at the delivery of the goods; they were to be determined by a valuation next day; but

this was not done, as the goods were taken under attachment as the property of B. A had given B his notes for \$2750 upon an estimate of the goods. In the suit to determine the title to the goods—Shealy vs. Edwards—the trial court decided against A; but on an appeal to the Supreme Court of Alabama the judgment was reversed. Judge Somerville, in the opinion, said: "If goods are sufficiently identified, a complete sale of them may be made without fixing an absolute price, if such be the clear intention of the parties, as legally evidenced by the circumstances attending the sale. This would seem a reasonable rule according to the principles of analogy adopted in all cases. In the construction of contracts generally it is first and pervading principle that the intention of the parties must govern, unless that intention contravenes some established principle of law. The same rule is equally dominant in construing wills. We deem it of paramount importance in construing contracts of sale—a subject which is still in much confusion, notwithstanding the vast resources of learning expended upon it by the jurists and law writers of the past century. In this case there was clearly a sale, and A was the owner."

GOOD-WILL—PROFITS OF TRADE.

The good-will connected with the establishment of any particular trade or occupation may be the subject of barter and sale. It is a valuable right, and, if it be unlawfully destroyed or taken away, the law will award compensation to the injured party. It is defined to be "the advantage or benefit which is acquired by an establishment beyond the mere value of the capital, stocks, funds or property employed therein, in consequence of the general public patronage and encouragement which it receives from constant or habitual customers, on account of its local position or common liability, or reputation for skill, affluence, or punctuality, or from other accidental circumstances or necessities, or even from ancient partialities or prejudice." It is claimed here that the plaintiff is seeking to recover for his loss of profits in trade, and not for the injury to his good-will. But the attachment complained of drove his customers away, and he lost their trade. Now, it is plain that if by any means customers are driven from a particular locality to which they resort to trade, that trade loses that which we have described as good-will. The distinction between profits and good-will is obvious—profits are gains realized from trade; good-will is that which brings trade. A favorable location of a mercantile establishment, or habit of customers to resort to a particular place, will bring trade. This advantage may be designated by the term "good-will;" what the trader gains from the trade so acquired are profits.—Carey vs. Garrison, in the Supreme Court of Iowa, by Judge Beck.

REMITTANCE—FAILURE OF BANK.

Salvage earned was remitted to New York from New Orleans by direction of those entitled to it, but before the draft reached its destination the bankers whose draft was sent failed. The standing of the house was unquestioned when the draft was bought. The salvors sued to recover the amount due them, and the defense was made of payment. In this case—Underwriters' Wrecking Company vs. Board of Underwriters—the plaintiff recovered a judgment, but on an appeal to the Supreme Court of Louisiana the judgment was reversed. Judge Manning, in the opinion, said: "The salvage was due at New Orleans, where the cargo was sent for sale. So far from demanding payment in New Orleans, the plaintiff instructed the defendant to remit, and if in remitting the defendant observed the same care, diligence and good judgment as in its own business, and the remittance is made in the customary manner, it was at the risk of plaintiffs. The defendants' faith in the solvency of the bankers was complete, and by their failure they lost a large sum on deposit with them. The crash came two days after the purchase of the draft for the plaintiffs. The remittance was made under instructions, without indicating any particular mode of remittance. It was much in the usual mode, and with the same care and diligence that a prudent man exercises in his own affairs. No more can be expected or is required of the debtor, and, having done that much, the defendant is discharged from all further care or responsibility."

Famous Bronze Doors.—Among the monumental works in bronze which emanated from Constantinople some of the most remarkable are the bronze doors which decorated several of the Italian churches, more particularly those which are enriched with inlays of silver. The church of San Marco possesses one brought from Constantinople, and which originally adorned the church of Santa Sophia, and, like the bronze horses, was brought to Venice as spoils of war in 1204. Other doors worthy of mention are those at Amalfi, in the Duomo, San Salvadore di Bireto, Atrani, the Benedictine Church at Monte Cassino, and the church at Monte Santangelo—the last four examples were all the gift of one family, the Pantaleoni of Amalfi. Those of San Salvadore, Atrani, were given by Pantaleone Viaterra in 1807, "pro mercede anime sue et merita S. Sebastiani, martyris." At Amalfi, in the cathedral of San Andrew, it is Pantaleone di Mauro who gives them, in honor of the Apostle, and for the repose of his own soul. At Monte Cassino another member of the same family gives the bronze doors, and these are enriched with silver letters, containing an account of all the possessions of this magnificently-endowed Benedictine abbey—the head house of the order. They date from 1666. At Monte Santangelo the Pantaleoni again are the generous donors of the bronze doors there. In the Duomo at Salerno are fine bronze doors, once containing silver inlays, given by Landolfo Butromile and his wife, 1099. The design consists of crosses and figures of six of the Apostles. The similarity of the five examples all point to a common origin; the same stiff Byzantine treatment of the figures and heads, which are shown by incising lines into the bronze and filling them with silver. These were evidently done to order at Constantinople, and are ascribed to a Greek workman, Staurachios—Romanized into Stauronius—who flourished about 1050-1072.

# The Iron Age

AND

## Metallurgical Review.

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#### The Labor Conference at Pittsburgh.

The first conference between committees of the Western iron manufacturers and the Amalgamated Association, regarding wages for the ensuing year, was held in Pittsburgh last Saturday. The demand of the workmen was for the old scale, with certain additions, which are as follows:

All branches of labor belonging to the Amalgamated Association, whether paid by the company or not, and not governed by scales, shall rise and fall in the same proportion to those branches which are mentioned in the scale.

In the conditions for boiling strike out the words "\$1 per ton extra for extra railroad-axle iron. The price for puddling, Sligo special or United States iron, shall be price and one-half the price of that paid for boiling iron."

In muck rolling add: "This scale applies to muck trains with two sets of rolls or less. On trains with three or more sets of rolls the extra hands required thereon shall be paid by the company, the Birmingham (England) coin gauge to be taken as the ruling standard weight in the sheet and wire mills. When sheets are lighter than the gauge they represent, the next higher or lighter gauge to be taken for the rolling price. For steel sheets rolled on iron-sheath mills the price shall be 20 per cent. above common iron prices."

In knobbling add: "Price for knobbling raw pig iron in the scale; the price to be \$2 per ton above the price paid for working refined iron. The price for making steel nails when it is harder than iron shall be 20 per cent. above the price paid for cutting iron nails. Also, when nails are made lighter than the specified sizes in the scale, the price shall be advanced in proportion."

Heretofore there has been no scale inserted for the nailers, and they propose the following, which has been the customary rate for several years:

1/4 clout	\$1.25
5/8 lining, fine	3.25
finishing	5.47
Third casing and box	1.68
Third brad heads	1.90
5/8 cooper tacks	5.71

The price for making steel nails when it is harder than iron shall be 20 per cent. above the price paid for cutting iron nails. Also, when nails are made lighter than the specified sizes in the scale, the price shall be advanced in proportion.

The manufacturers refused the demand, and in turn insisted upon the old scale, with a reduction of 10 per cent. This was refused by the workmen, and the conference adjourned without date. This does not, however, preclude further negotiations, but is rather one method of expressing the determination of both sides to adhere, for a while at least, to the demands made. Whether a strike or lockout will result cannot be predicted until the temper of both parties is more fully known, nor until the time of finally settling

the question of signing or not signing the scale approaches. The chief point at issue is whether the present scale shall remain in force or whether there shall be a reduction of 10 per cent. It is understood that the manufacturers justify their demand for a reduction not only on the ground that the condition of trade justifies them in asking it, and, indeed, makes it a necessity if they are to continue in operation, but also that it will be better for the men themselves, and will enable them to earn more money through increased work than they will earn if the old rates are continued. The increased competition of steel, which has become more marked the past year and promises to increase greatly the ensuing year, was also urged, as were the reductions that have been made in wages in steel-making. The lower wages East and the recent reductions there were also given as reasons why reductions should be made West. The workmen claimed that reductions in wages would not benefit the manufacturers; that the trouble grew out of the fact that they were not true to each other, but cut prices, and that a reduction in wages now would only result in further cutting, and after a little the same arguments would be used to secure a still further reduction of wages. It was also claimed that, at some points in the East, Western iron was being sold as low as it could be made East, even with the lower rates of wages ruling there.

There is evidently a good deal of force in the positions assumed by both the parties to this controversy. It certainly needs no argument to show that when iron is selling at 1.7 cents to 1.8 cents wages should not be as high as when selling at 2.5 cents. If the theory of the sliding scale is correct, and wages should go up and down as the selling price advances or declines, the demand for a reduction is a most equitable one. It would also seem to need no argument to show that, if the work is no more difficult, the Western manufacturers are entitled to have their work done at as low wages as it is done East; but there is also force in the question of the workmen, What good would it do? "Should we reduce," they say, "the reduction will all be given away at once, and the manufacturer, to force sales, will cut the price an amount fully equal to the reduction." Under the present condition of trade this would undoubtedly be the result. The chief benefit of the reduction would be to stimulate trade and enable the low sections to compete on a more favorable basis, and perhaps secure a larger share of the trade to the Western mills. Should it do so, the men would have more work and earn a larger amount of money in a given time. But in the end wages must come down. The law of supply and demand must work in labor as well as in trade, and if there are more men to work than work to be done, labor must take less.

The demands of the men as expressed in the additions to the scale are of some importance. Some of them are most radical changes, the result of which it is impossible to foresee. The first is that the wages of all classes of labor included in the membership of the association not now regulated by a scale shall hereafter advance or decline with the scale. This is an exceedingly important change, and one the effect of which no one can estimate. It certainly will introduce many new elements of discord, and, as these classes are paid very different rates at the several mills, it must result in the formulation of scales for each class.

The steel question also crops out in connection with the sheet and nail amendments. The large increase already in the production of steel sheets, and the prospective increase in the make of steel nails in the near future, lead to the reopening of a question that has been a serious point of discussion for several years past, and which it was supposed had been settled. The rule has been that when the output of steel is as great as of iron, iron prices shall be paid. It is uncertain just what these clauses mean. One thing is clear, however; if the Amalgamated Association intend to ask 20 per cent. extra for cutting steel nails, they have a contest before them of a serious character.

On the opposite page we print a letter on the subject of railroad car axles, which is deserving of attention, not only from axle manufacturers, but also from the general public. Appreciating the grave consequences which must ensue from a continuance of the present abnormally low prices of axles, a meeting of the forgemasters of the United States was held in Cleveland on the 3d inst. to devise some means for advancing the price of axles to a remunerative figure. The resolutions adopted at this preliminary meeting did not propose any definite plan of action, but simply stated the existing evils and called upon the car-axle manufacturers to join the association for mutual benefit and protection. The next meeting of this association is to be held at Buffalo on May 6, at which it is hoped that all the forges will be represented, and that some decisive action may be taken to advance the price of axles and provide against a recurrence of such ruinously low prices in the future. It is a fact which needs no argument that, when prices fall so low as not to pay the cost of an article, the article is sure to deteriorate in quality until its value approximates to its price. For this reason it is to be hoped that the convention to be held in Buffalo next month will accomplish its purpose, as both life and property are too much dependent upon the reliability of railroad car axles to allow of inferior iron being used in their construction.

### Southern Pig Iron for \$12.50.

The statement is reiterated with much positiveness and directness that a contract has actually been made in the South for the delivery of 70 tons of pig iron daily for 10 per cent. It is understood that the manufacturers justify their demand for a reduction not only on the ground that the condition of trade justifies them in asking it, and, indeed, makes it a necessity if they are to continue in operation, but also that it will be better for the men themselves, and will enable them to earn more money through increased work than they will earn if the old rates are continued. The increased competition of steel, which has become more marked the past year and promises to increase greatly the ensuing year, was also urged, as were the reductions that have been made in wages in steel-making. The lower wages East and the recent reductions there were also given as reasons why reductions should be made West. The workmen claimed that reductions in wages would not benefit the manufacturers; that the trouble grew out of the fact that they were not true to each other, but cut prices, and that a reduction in wages now would only result in further cutting, and after a little the same arguments would be used to secure a still further reduction of wages. It was also claimed that, at some points in the East, Western iron was being sold as low as it could be made East, even with the lower rates of wages ruling there.

A Western contemporary throws a little side light on this matter by stating that Mr. De Bardeleben owns some thousands of acres of land at Elyton, which he acquired for a comparatively small sum, and he now proposes to build a new city there. A blast furnace will be a very good nucleus for manufacturers, and a large foundry will help the project along amazingly. Quite a *furore* exists in some parts of the South, particularly in Northern Alabama, over projects to build new cities, and the Elyton contract seems to be part of such a scheme. The iron is to be delivered at Elyton at \$12.50 per ton, and it is suspected that the purchasers themselves pay the freight to Nashville on the pig iron which they have agreed to receive there. Even if \$12.50 merely covers the bare cost of producing the pig iron, the "new city" scheme carries with it an immense profit to the owner of the acres which will be utilized as town lots. The promoters of the city of Birmingham, Ala., could attest to the enormous profit to be derived from a successful venture of this character.

As a shrewd, sagacious and far-sighted business man, Mr. De Bardeleben is to be complimented on his enterprise in attracting capital to Northern Alabama, and causing manufacturing towns to spring up in that richly-favored but long-neglected country, and he deserves a good return for the benefits he confers upon parts of the United States, which has too long been in need of enterprising men like himself. But there is no necessity and no justification for the prophetic warnings now coming up by way of the State of Kentucky that a new order of things has come upon us and an industrial revolution is impending. We are of the opinion that the price of pig iron will be much lower in this country in the years to come than it is now, and we believe that the South is destined to become more of an element in supplying the iron wants of the country than she is to-day; but when the cheap pig iron dawns upon us the North will continue in the business at the old stand, though Northern workmen will not then be so well paid as they are now.

There are furnaces in the North that are exceptionally well located which could make as good a showing if they chose to do so as any of the new Southern furnaces, but they are few in both sections, and the average furnaces are the ones to be considered in comparing the merits of respective localities. We have no special interest in the blast furnaces of Pennsylvania, New Jersey or New York. We are proud to say that we represent no special section. Our patrons are found in every nook and corner of this country, as well as in numerous localities outside of it. We give credit to every enterprise of merit, whether it is founded in Maine, or Georgia, or Alabama, or Texas, or California, or Pennsylvania. We glory in the industrial growth of this whole country, and we hope to see the day when manufacturers will be properly developed in every section, each locality pursuing the vocations for which its inhabitants and climate and resources are best fitted, and all working together for the best interests of themselves, their fellow-citizens and their common country.

#### Taxing Commercial Travelers.

We boast of the freedom of trade throughout the United States. Whatever our foreign policy may be, we seek to make domestic commerce as free from restrictions as possible. The objectionable *octroi*, so common in European cities, is not charged on any goods sent to an American city for sale. No State has the power to levy duties on any merchandise imported into it from a sister State. The goods manufactured in the State of New York can be sent anywhere in the United States without any additional charge being imposed by the local government at the point of delivery. A merchant who transacts a national business has, therefore, no other elements to consider in placing his goods than his own and his competitors' prices and freight rates, whether he sends his wares to Maine, to Alabama, to California or to any other State within this broad Union.

Sales are very largely made by sample, however, and immense numbers of commercial travelers are employed by merchants and manufacturers to extend their business,

These travelers find that internal trade is not so free from restrictions as the Constitution of the United States seems to make it. In a considerable number of States the local merchants have inspired the enactment of laws requiring licenses to be taken out by persons from other States desiring to sell goods by sample, which licenses are held at such a high rate that they form a heavy tax on the business which is sought to be done. In very many instances this tax effectively bars the State from visits by the representatives of outside merchants. While local jobbers thus secure their home trade to a considerable extent from the inroads of active competitors residing in other States, they at the same time enjoy the opportunity of sending their own commercial travelers into many States where no such restrictions are imposed upon trade. The business of this country has now grown to such proportions, and our railroad facilities are so ample, that a great deal of annoyance is experienced by merchants and manufacturers whose travelers very frequently find themselves called upon to pay a heavy fine for violating State laws of the character referred to.

So important is the question that the Committee on Manufactures of the National House of Representatives have had under consideration measures to put a summary stop to the practice of taxing commercial travelers, and have reported in favor of the bill introduced by Hon. J. H. Brewer, of Trenton, N. J., which provides that any corporation or officer of a State or municipal Government interfering with commercial travelers should be deemed guilty of a misdemeanor, and be liable to indictment before a United States Grand Jury in the district in which the interference occurred, and, upon conviction, to pay not exceeding \$100 fine or be imprisoned three months, or both. The committee declare in their report that the States imposing these taxes are guilty of infringing the Constitution of the United States, as the laws under which the taxes are levied have been pronounced unconstitutional by the Supreme Court, yet they continue to enforce their fines, penalties and taxes, relying upon the belief that the trouble and costs of redress through the courts will protect them from the law. As these cases, when carried to the Supreme Court, take three years of time and at least \$1000 in moneys to defend, it can be seen at once why business houses submit to the imposition.

The purpose of these tax laws appears plainly to be, not the raising of revenue, but the securing of a special advantage to local jobbers, and they are therefore, in the judgment of the committee, inimical to the best interests of the consumers and the masses of these various localities. Congressional action seems to be absolutely necessary, and the bill of Mr. Brewer is a step in the right direction, in order that the commerce between the States may not be restricted and the citizens of the several States debarred from the freedom guaranteed them by the Constitution. Every enterprising wholesale house and manufacturing establishment in the United States, along with 200,000 commercial travelers, pray for the relief afforded in this bill and for its passage at this session of Congress.

#### Our Foreign Wheat Market.

Some remarks which we made in last week's issue concerning our foreign wheat market have commended themselves to the favor of Hon. Wm. D. Kelley, who has written us an approving letter. The Father of the House long ago foresaw the inevitable competition this country would meet in supplying Western Europe with wheat, and has, therefore, labored diligently for a diversification of our agricultural pursuits. In 1867 he delivered a number of addresses in the West on this subject, and specially urged the production of sugar. At that time he believed that beet-root sugar might be produced here, but he since learned to doubt whether our soil is not too fresh and too rich in alkali to yield beets from which the saccharine matter can be extracted at a cost that will permit the production of a commercial sugar. In the meanwhile, however, events have demonstrated the possibility of supplying the country with sugar from corn and sorghum, and the Judge says it has been more than demonstrated that in those portions of our country in which the seeds of sorghum would ripen they alone would pay for its production, leaving the sugar, syrup, fodder and begasse as profit. He highly recommends, as a valuable contribution to this subject, the recently-published work of Peter Collier, late chemist to the Department of Agriculture. The Judge believes that we can produce all the sugar we need, and thus secure a new field for \$100,000,000 worth of agricultural productions. He also heartily favors the removal of the internal revenue tax on whisky, in order to secure cheap alcohol for the arts, which tax really amounts to a direct levy on corn—an agricultural product. Highly-taxed alcohol prevents many American products from entering foreign markets. With alcohol free of internal revenue tax we could enter the markets of the world with alcoholic drugs and perfumery. In many other directions than those briefly referred to our agriculture could be properly diversified and profitably encouraged. There is a vast deal of work to be accomplished, both in the direction of agriculture and of manufactures before this country possesses a harmonious, symmetrical and perfectly developed industry.

Assuming that the application to Congress of the American Express Steamship Company is made in good faith, that it is only intended in the interest of the organization referred to, and that the passage of the desired bill is not to be regarded as a wedge to open the way for the introduction and passage of bills for the registration of all sorts of ordinary steamships, which we know can be built here, the project does not seem to be specially objectionable. It is, of course, humiliating to think that these expensive vessels will not be built in this country, and that their construction abroad will put taller feathers in the caps of our greatest industrial rivals; but, on the other hand, the carrying trade of the Atlantic should be at least partly under our control. It is patent that the usual type of ocean steamer cannot now make any profit, as some of the most progressive British steamship companies are passing their dividends, and to be successful a new enterprise must present such points of novelty and excellence as will attract the most profitable kind of business, and this seems to be the aim of the new American company. To carry out their plans they are obliged to go outside the country for vessels that will, without risk of failure, come up to the high standard required. We sincerely hope that Congress will speedily act on the various bills before it for the relief of the shipping interest, so that our commerce will be delivered from the fetters of those antiquated restrictions which make it so costly to sail an American ship to a foreign port, and with this little encouragement, if no more can be given, we trust that our maritime interests will grow more rapidly, so that our shipbuilders will have a greater variety of work to give them experience and speedily make it unne-

cessary to sail to foreign ports. We hope that the American Express Steamship Company will be successful in its efforts to establish a line of steamships for the carriage of passengers and mails exclusively between New York and some port on Long Island and a suitable port in Great Britain. The promoters of the company propose to land Transatlantic mails at the New York post-office in 6 days and 3 hours, which will effect quite a saving in time as compared with the time now required, which is about 8 days and 7 hours. To accomplish this, the mails will be transferred from the steamships to the railroad at Montauk Bay, Long Island, and the steamships themselves are to have a speed of at least 18 knots an hour, to insure quick transit across the ocean.

cessary for any American steamship company to ask permission to have their vessels built abroad.

#### Developments in the Spelter Market.

When we last wrote on the position of spelter, at the end of February, prices here had declined to a low ebb, common domestic selling at 4½ cents @ 4½ cents, about the lowest point for years, as we showed by a table giving the price for each month in 1850-81-82-83. During March and April the long-delayed demand at length began to manifest itself, and the price has gradually improved to 4½ cents. Considering the general dullness in the metal market, this improving tendency in spelter certainly indicates that there are powerful reasons for the advance, unaccompanied as it is by speculation. The fact is that the revival in the demand finds the market in various important centers of distribution either bare or with greatly reduced stocks, while the output is notoriously light, curtailed by the unprofitableness of the industry in almost every locality. It is conceded that the position of spelter on this side has recently undergone a favorable change, and it becomes a matter of interest whether there is a probability of the price advancing sufficiently toward summer to induce importation. Our importation some eight years ago had dwindled to very small proportions, for at that time home production sufficed to cover consumption, but during the past four years there has been more room for foreign spelter for use in special purposes—galvanizing in particular—and in 1882, as will be seen by the table below, we had to procure a large amount from abroad, the demand for galvanized fence wire being more active than before or since.

*Import of Spelter into the United States, in tons of 2240 pounds.*

Calendar year.	Tons.	Calendar year.	Tons.
1876.....	225	1880.....	2,750
1877.....	508	1881.....	2,400
1878.....	492	1882.....	11,451
1879.....	1,908	1883.....	8,882
Total.....	3,133	Total.....	20,543

This shows that we imported during the past four years nearly seven times as much as we did the previous four years.

While this demand for and improvement in spelter has been going on on this side, Europe has shown no particular buoyancy, although it has been reported from there for months past that in Upper Silesia and Spain ore was getting both scarcer and dearer. The price remains depressed in Europe, probably on account of the open winter in Silesia and the great activity that has been prevailing at the smelting works there, but a general revival in business, which may soon take place, would undoubtedly cause an upward turn. We do not place much confidence in the success of a syndicate on the Continent, for a combination of that kind has but too often proved a failure; spelter may without such assistance possess intrinsical soundness enough to improve, as it has done here. Should a demand for America arise in the meantime, it would in all likelihood not fail to favorably influence the European market, although the 8000 tons we may take in 1884 are but a trifling withdrawal from a production of 250,000 tons. Whichever way we examine the position of spelter, it seems to inspire confidence, and there are grounds for believing it is on the eve of a material advance.

We are favored by Messrs. Ladenburg, Thalmann & Co., of New York, with the subjoined table showing the spelter production of the world since 1880, compiled by Henry R. Merton & Co., London:

Production of Spelter in Europe and the United States.				
	1883	1882	1881	1880
Rhine District & Belgium.....	129,801	119,158	110,989	98,830
Silesia.....	70,405	65,114	66,407	64,450
Great Britain.....	52,105*	55,581*	49,119	52,000*
France and Spain.....	14,671	18,975	18,358*	18,000
Poland.....	3,788	4,400	4,000*	4,000*
Austria.....	2,879*	3,199	2,530*	2,530*
	943,290	899,259	826,783	806,800
United States.....	92,790*	93,765*	30,000*	29,239*
Tons.....	256,080	273,024	256,789	260,048

\* Estimated.

We observe that the reasons for the failure of a Western steamboat-repairing company are alleged to be "two fires, the floods last year and this year, and the dull business of the past six months." The company have certainly been severely afflicted, but the list might have included bad debts, a patent litigation, the defeat of the bonded whisky bill, the riots, and the late fall in the price of wheat, for the greater consolation of their creditors.

On the 21st inst., at Youngstown, Ohio, a meeting of creditors of Brown, Bonnell & Co. rejected a proposition of the stockholders to settle for 50 cents on the dollar, or the full amount in stock in the new organization. A committee of five of the principal creditors was appointed to further consult the mortgage creditors and stockholders for final action, and report at a meeting to be held April 29. Cleveland creditors offer the principal opposition to the organization. The mills, with a dull iron market, cleared \$98,000 last year.

Messrs. C. B. Porter & Co., importers of tin plates and manufacturers of tinware, 128 North Second street, Philadelphia, have contracted for a new warehouse building, which is already well under way and will be completed early in June. The structure is situated at 231 North Second street, and is of brick, occupying a lot 250 feet deep. The

building itself is to be 150 feet deep, 28 feet front and four stories high, with unusually thick walls and heavy floors, designed for the storage of tin plates and metals. Two powerful elevators built by Clem & Morse, Philadelphia, will comprise the hoisting apparatus, and the structure, when completed, will be a very substantial and well-furnished warehouse. Messrs. Porter are about to issue a very low net price list on all goods in their line, which will be ready for distribution in a short time.

#### Railroad Car Axles.

To the Editor of *The Iron Age*.—DEAR SIR: In the reports of the condition of the iron trade I have been looking in vain for some word relative to one of the most important branches of not only the iron trade, but also of the greatest interest to railroad corporations, viz., car axles. In the market reports of iron, prices are given of almost every article manufactured, either of cast or wrought iron, save car axles, and this last article is really the most important of all, for upon its strength and quality so much depends as regards life and property.

As an ex-railroad official my attention has been called to this important part of construction of cars, on account of the astonishing low prices now ruling, and I wish to ask of railway managers and purchasing agents if, in the economy of their purchases for car building, it ever occurred to them that it is simply impossible to lay down \$5 and expect to get \$10 return? If they do, it will be spurious. Upon inquiry I find that hammered-scrap axles are being made at the very insignificant price of 2 cents per pound, and at even lower prices. We all know that every one transacting business does so for what profit he can make out of it, and can we suppose that a concern will make and sell an article for 2 cents what costs 2½ cents? I have been at some trouble to ascertain approximately the cost of making a car axle, and, as near as I can find out, good scrap iron, such as is only fit to make an axle of, costs from \$22 to \$24 per ton; the average price of coal is about \$2 75 per ton; the wages of expert axle-makers are as high now as when axles were selling at 4 cents per pound. Now, the result I arrive at is that the cost of an axle ready to turn up is not less than 2½ cents per pound. Can it be credited by any sane man that such an axle would be or is sold for 2 cents per pound? And yet axles are sold for that price. The question then arises, Of what material are they made? This question will soon answer itself by the wrecking of trains caused by broken axles, and on examination the material will be found to be old rails or an inferior iron even worse than old rails.

This is a serious matter, and one which railroad managers and purchasing agents should look into carefully, or they will find that some day they will wish they had paid 10 cents per pound for their car axles. The rapid rate at which trains are run makes this question of transportation of human beings of the greatest importance as to safety. There is but one railroad corporation in this country who properly consider this question, and they have their axles made of iron according to a formula of their own, and they pay a good, round price, and I believe at this time are paying 8 cents per pound. I should like some one better posted than I am to give the facts in regard to the manufacture of this important article, and if our railroads will not do as they should for the safety of life, limb and property, the strong arm of Government should be invoked. Yours,

Ex R. R.

#### Effect of Expiration of Foreign Patents on Life of United States Patents.

Office of Dodge & Son,  
ATTORNEYS AND SOLICITORS OF PATENTS,  
WASHINGTON, D. C.

To the Editor of *The Iron Age*.—SIR: In your issue of the 10th you publish an opinion in reference to the effect of a prior foreign patent on the duration of the United States patent for the same invention, which, if followed, will lead the owners of patents into trouble.

As you will observe, that opinion was given early in 1882, and since that time there have been several decisions of the courts on the question involved which entirely overrule the position therein assumed.

In the case of *Riesner et al vs. Sharpe*, 16 O. G., 355, Judge Blatchford held that the United States patent, which was granted October 20, 1874, by force of Section 4887 expired at the end of the term of five years from May 15, 1873, that being the date of the Canadian patent, which was granted for five years, with the privilege of renewing it for five or ten years more, as provided in the Canadian law. In that case the Canadian patent had been renewed or extended before the expiration of five years, and yet the court held that that did not save it—the original grant was for five years, and Section 4887 limited the life of the United States patent to the term of original grant, and that hence the United States patent expired at the same as the Canadian patent.

Again, in the case of *Bate Refrigerator Company vs. Gillett*, 22 O. G., 1205, Judge Nixon held precisely the same, on the same condition of affairs. In that case, too, the Canadian patent had been extended.

Again, as late as August 29, 1883, in the case of the Gramme Electrical Company vs. the Arnoux and Hochhausen Electrical Company *et al*, 25 O. G., 103, Judge Blatchford repeated this ruling in a case where an Austrian patent had been previously granted for the same invention, the Austrian patent bearing date December 30, 1870, and the United States patent bearing date October, 17, 1871. In that case it was shown that the application for the United States patent was filed before the application for the Austrian patent was; and, further, that although the Austrian grant on its face was but for one year, it was, in fact, under the Austrian law, a 15-year patent, as it could be kept alive for that period by the payment of certain fees, &c. Still the court held that the United States patent expired by the operation of Section 4887, at the expiration of the term for which the Austrian patent was originally

granted, which was for one year from its date.

In the case of *Henry vs. Providence Tool Company*, 14 O. G., 855, decided in October, 1878, the court held the same, although in that case the prior English patent had been extended. Still the court held that the United States patent expired with the original term of the English patent.

It will therefore be seen, under the recent decisions, there is no longer any room for question on this point. A patent in the United States expires at the same time as the foreign patent which has the shortest term to run, in all cases where the foreign patent issued before the United States patent, even though the prior issue abroad was not intended. This condition of the law works great injustice to American inventors, as not unfrequently their applications here are delayed by unexpected causes—interferences, newly discovered references, &c., after they have been allowed, and by that means their patent abroad issues first, when they did not intend to have it do so, and without any fault of theirs. It would seem but simple justice to hold that this rule should not apply in such cases.

A bill is now pending before the Senate (No. 672) amending Section 4887, so that all patents hereafter granted in the United States shall run for the full term of 17 years from the date of the earliest foreign patent, but in no case to remain in force for less than 17 years, and the application to be filed here within two years from the date of the foreign patent.

All persons interested should write their Senators and Members, urging the passage of this bill, which for the past six years we have been endeavoring to have passed.

DODGE & SON.

April 21, 1884.

#### Internally-Fired vs. Externally-Fired Boilers.

To the Editor of *The Iron Age*: The *Iron Age* of March 6, 1884, contains an article by Mr. George S. Strong, on forms of strength and efficiency in steam-boiler construction, the chief object of which seems to be to show that the Fox corrugated furnace is a great improvement to the Scotch type of marine boilers, and that it will also be found an improvement when introduced into internally-fired boilers for land and locomotive practice.

So far as Mr. Strong's article is confined to this object, no exception can be taken to it; but, incidentally, he makes a comparison of merits of internally and externally fired boilers, and draws some conclusions which the writer thinks are entirely without foundation.

In the first portion of his article he says: "The Lancashire and Galloway boilers have driven out all competitors from England and on the Continent; so must they, or modifications of them, drive out competitors in this country when their advantages are properly appreciated and understood." There are two objections to this statement. First, the Lancashire and Galloway boilers have not driven out all competitive boilers in England and on the Continent, and for land practice their importance is diminishing, as they are meeting with strong competition from several makes of externally-fired boilers, and especially externally-fired boilers on the water tube system. Second, there is no probability that the Lancashire and Galloway boilers, or modifications of them, will drive out competitors in this country when their advantages are properly appreciated and understood, from the simple fact that as soon as their advantages are understood their disadvantages will also be apparent, and this will effectively prevent their introduction into this country.

As to efficiency, Mr. Strong continues: "Every one who has had the opportunity of observing the results of careful tests and long-continued experiments must be convinced that the internally-fired boiler has great advantages." \* \* \* "In this case it will be possible to get 10 pounds of evaporation as regular practice, instead of 7 pounds, as is now the average with externally-fired boilers, in which the best and most effective portions of the heat—that is, the direct rays from the coal—are absorbed in the brickwork, while the gases are passed into the tubes and condensed before being consumed."

As one of those who has had opportunity of observing the results of careful tests, the writer dissents from Mr. Strong's opinion that any such increase of evaporation as from 7 to 10 pounds can be expected from the simple substitution of an internally-fired for an externally-fired boiler, and could refer to scores of tests of externally-fired boilers in which the results were so good that it would be scarcely possible to beat them with any other form of boiler. At the Centennial Exhibition there was a well-designed plant of Lancashire boilers, improved by the use of Galloway tubes, and, when tested with the same coal, the results were equalled and even exceeded by several makes of externally-fired boilers. Mr. Strong is also mistaken in his statement that the most effective portions of the heat—the direct rays from the coal—are absorbed in the brickwork, since it is certain that these bricks, after they are once heated up to the temperature of the fire, thenceforth radiate to the fire and boiler all the heat which is received by them. As to the gases being passed into the tubes and condensed before being consumed, that is more likely to happen with an internally-fired boiler than with an externally-fired one, since in the former the furnace is surrounded on the sides by chilling surfaces, while in the latter it is surrounded, at least partially, by heating surfaces of fire-brick, the heat radiated from which assists in securing perfect combustion, and thereby increasing the economy. In locomotive practice with soft coal it has been found beneficial to make a fire-brick roof in the furnace, and even Galloway boilers have been set in Cuba with fire-brick furnaces, and fired underneath the shell, thus converting them into externally-fired boilers. The English engineering papers not long ago contained an account of a German's improvement in the economy of some internally-fired locomotive boilers, by cutting off the fire-box and re-setting with fire-brick furnaces.

Probably the best evidence of the fact that the internally-fired boiler is not going to

supplant the externally-fired one in this country is that shortly after the Centennial Exhibition a finely-equipped and very expensive plant for the construction of these boilers was established at Edgemore, Del., and, notwithstanding the fact that one of the best engineering firms in this country have had the agency of the Galloway boiler for some years, they have succeeded in making since that time but very few sales.

The principal disadvantages of the internally-fired boiler are due to the fact that, whenever economy of fuel or space occupied are main considerations, the boiler must be of large diameter and great thickness of shell. In the best marine practice the diameter of shell is 14 feet or more, and the thickness 1 inch or more. The disadvantages entailed by such excessive diameter and thicknesses are:

1. That, notwithstanding the great thickness of the boiler—viz., the outer shell—is not *heating surface*, but only containing surface, and is useless for the very purpose for which a boiler is designed—that of transferring heat from the fire to the water. The great weight of metal which is not heating surface makes the boiler proportionately very costly.

In Europe, where metal and interest on money both cost less than in this country, the high first cost is not a serious disadvantage; but in this country the high first cost is one of the chief reasons why such boilers have not been adopted hitherto, and which will effectively prevent their adoption in the future, especially when boilers of small diameters can be made nearly as efficient as regards economy of fuel and of space. In addition to these disadvantages, there is a further one—that the internally-fired boiler generally has low furnaces, surrounded by chilling surfaces, which prevent the thorough combustion of the gases.

The boiler of the future must be one in which pressures of 150 pounds or over can be safely carried, and of which the first cost is not excessive. These conditions are met only by boilers in which the water is contained in shells of small diameters and thicknesses, and in which the major portion of the metal is efficient heating surfaces—viz., in externally-fired boilers. Respectfully,

M. E.

#### Some Canadian Census Statistics.

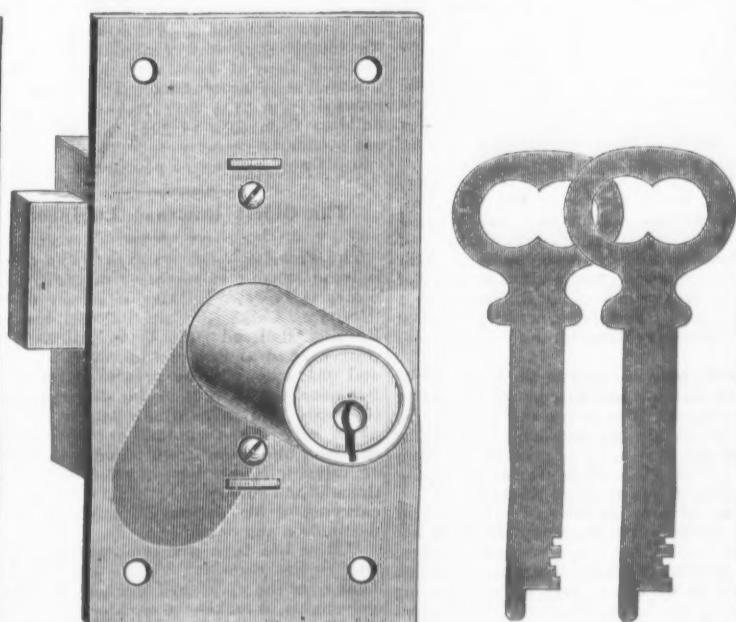
The second volume of the "Canadian Census for 1881," just published, though devoted exclusively to vital statistics, furnishes data for some interesting comparisons of the material progress of the Dominion during the past decade. As regards population, the growth of our neighbor appears quite respectable in the light of percentages of increase, although the numerical additions are not imposing. The increase in the total population in 10 years was less than a million, but the percentage was not far behind that of the United States, being 24 per cent., against 30 in the latter. In the two Provinces of Ontario and Quebec, which together contained 3,282,255 out of the 4,324,810 for the whole country, the ratio of increase was considerably smaller, being 18 per cent. for the former and 13 per cent. for the latter. In fact, one-third of the total increase is due to the enumeration of the population of Provinces not included in the previous census, as Prince Edward Island, Manitoba, British Columbia and the Territories; though it is likely that these contained but few inhabitants at that time. Immigration, due to the attractions of Manitoba particularly, was more conspicuous than ever before, and it was in the agricultural classes that the principal growth in the Canadian population has taken place. About one-fourth of the people are registered as being employed in some occupation, and their classification for the two last censuses is as follows:

1871..... 1881..... Per cent.  
Agriculture..... 479,512 662,680 38  
Industrial..... 212,803 287,296 36  
Commercial..... 75,201 107,646 43  
Domestic..... 60,104 74,830 25  
Professional..... 39,144 52,574 35  
Not classified..... 143,079 206,528 43

Total..... 1,009,849 1,360,604 36

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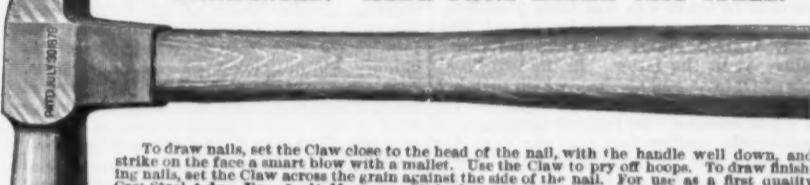
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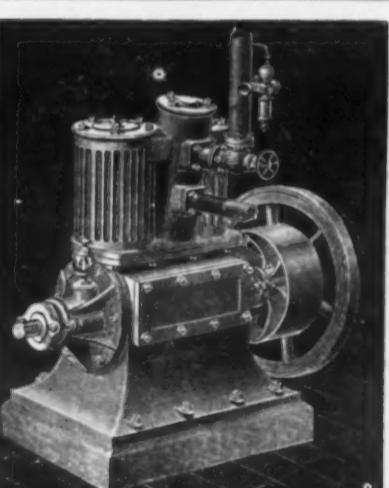
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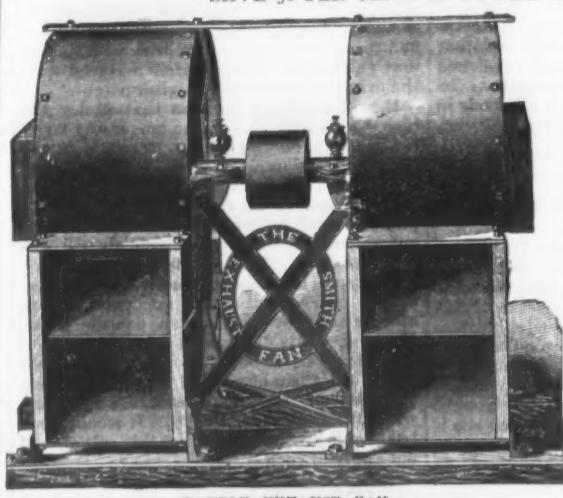
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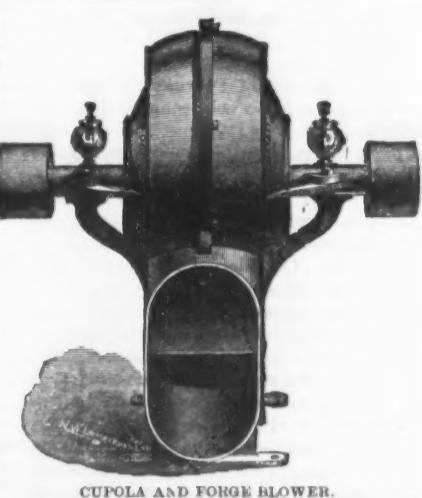
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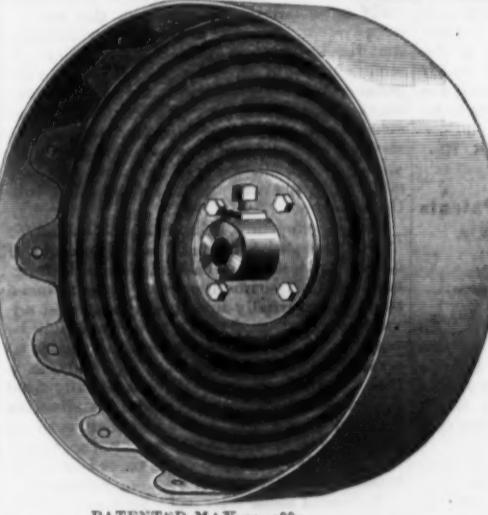
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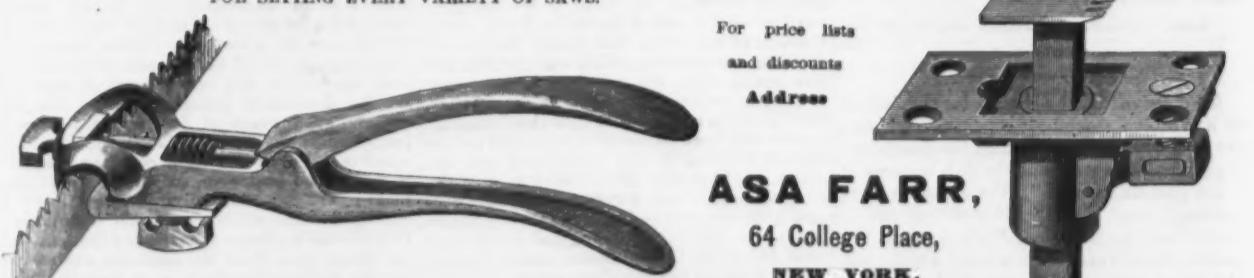
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15 x 24, 16 x 42, 15 x 36, 14 x 36, 13 x 36, 15 x 24,

11 x 24, 10 x 24, 12 x 36, 13 x 36, 8 x 16, 8 x 20,

8 x 10, 7 x 12, 7 x 8, 6 x 7 Side Valve Engines, new

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Locomotive and Upright Tubular Boilers, all sizes.

Ferriss & Miles Steam Hammer, 4<sup>1</sup>/<sub>2</sub> x 12 cylinder.

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All the above guaranteed in good working

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15 H.P. Horizontal Stationary Engine. New.

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The undersigned has just patented a machine

for breaking down Bituminous Coal in the mine

instead of blasting to which he desires to call the

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A FIRST-CLASS Machinist and Steam-Fitter, having

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Pattern Making, and Fittering, at present holding

a position of Foreman, would like to make a change

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**Special Notices.****New and Second-hand Machinery, Engines, &c.**

One 16-in. swing, 7-ft. bed Engine Lathe.

One 18-in. " 10-ft. "

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One 20-in. " 14-ft. "

One 26-in. " 12-ft. "

One 8-ft. 32-in. " (New).

One 8-ft. 32

# Trade Report.

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, April 22, 1884.

**Pig Iron.**—The market remains in much the same position as detailed week ago, and cannot fairly be said to be either better or worse. There is rather more inquiry, and, as regards Foundry Irons, holders are less disposed to shade prices than they were a week or two ago, the outlook for this class of Iron being somewhat more favorable. Stocks are light, and the current output is so largely taken on old contracts that the surplus is barely equal to daily requirements. Prices are unchanged, but there is a firm tone to the market, and \$20, delivered, for good No. 1, may be considered a minimum quotation. At the same time consumers show no anxiety about the future, and those who are buying from hand to mouth are probably getting Iron at as low figures as those who made contracts three or four months ago. The leading feature of the market, therefore, is complete indifference, no special anxiety to sell, and still less so to buy, unless it may be to cover immediate requirements. Attempts have been made to secure bids of \$19 and \$20 for summer deliveries by parties wishing to blow in a furnace or two, but there are no buyers at these figures unless for spot lots, so that if the furnaces are blown in the product will have to be sold from week to week at whatever figures the market may afford. Mill Irons are not quite as firm as Foundry grades, although some of the leading brands maintain a strong position at unchanged figures. There is a great deal of Iron offered at irregular prices, however, and, while some may be of good quality, others are more or less uncertain; hence buyers are afraid to touch it; but the effect on the market is very depressing. Good to choice Neutral Irons are held at from \$18 to \$19, delivered, while Cinder Irons are quotable all the way from \$17.50 down to \$16 or \$16.50, according to circumstances. The weakness, therefore, is more in off-grade Irons than in standard brands, although they impart some appearance of weakness to the general market—probably more in appearance than in reality.

**Foreign Iron.**—Nothing doing in Bessemer except in small lots, and no inquiries likely to lead to business. Low-Grade Spiegel is wanted at about \$24, Philadelphia or Baltimore, but holders ask from 50¢ to \$1 more money for such shipments, although willing to deliver in New York at \$24. We note sale of 1500 tons German Spiegel at \$23.75, Philadelphia.

**Muck Bars.**—The demand is not as brisk as it was some time ago, but sellers are moderately firm at former quotations—say, \$31 @ \$32, at mill, according to location—with sales at extreme quotations both ways.

**Blooms.**—The market is very quiet, and only limited quantities can be placed at quoted rates, which are nominally about as follows: Charcoal Blooms, \$55 @ \$56; Run-out Anthracite, \$45 @ \$46; Scrap Blooms, \$41 @ \$42; Northern Ore Blooms, \$39 @ \$41.

**Bar Iron.**—There has been very little change to notice for some time past, the general report being that the market is as dull and unprofitable as it possibly can be. There is no improvement in the demand, but inquiries are more numerous, and in view of the near approach of summer and the possibility of a considerable restriction in the output, sellers are more conservative, although still very anxious for business. So far as can be learned by careful inquiry, the demand is still of an exceedingly limited character; no large lots are required for, and even for small lots prices have been very unsatisfactory. Strictly first-class Refined Iron is held at 1.9¢ @ 2¢. Some claim to buy at less money, but for standard makes these are firm quotations, although Western Iron is offered at considerably less money.

**Plate and Tank Iron.**—Business continues very quiet, the demand for Plates being of the merest retail character. The mills are running very close to the end of their order-books, and for the present there is nothing to warrant the expectation of any material replenishment. Inquiries seem to have fallen off altogether, and the outlook is most discouraging. Prices are nominally the same as before, but on good-sized orders concessions would doubtless be granted. The usual quotations are: Boat Plate and Tank Iron, 2.2¢ @ 2.25¢; Shell, 2.75¢ @ 2.85¢; Flange, 3.75¢ @ 3.85¢; Fire-Box, 4.75¢.

**Structural Iron.**—The demand is fair, and about sufficient to enable manufacturers to keep their mills at work on half or two-thirds of their capacity. There is probably a better outlook in this than in most other departments of the Finished-Iron trade, although business cannot by any means be considered as altogether satisfactory. Prices are cut very close, while the amount of work under contract is not large, although there is reason to believe that there will be a steady flow of orders for some time to come. Prices remain as last quoted, viz.: Angles, 2.2¢ @ 2.25¢; Bridge Plates, 2.25¢; T's, 2.75¢; Beams and Channels, 3.5¢, less the usual discount on large orders.

**Sheet Iron.**—The demand is quite active, but prices, which have been for some time past at most unremunerative figures, show no improvement. Prospects for a large trade during the summer months are quite encouraging, and, while prices are held

with considerable firmness, it will not be easy to establish an advance, in view of the general depression in the Iron trade. Small lots are quoted as before, viz.:

Best Refined, No. 28.....	4 1/2
Best Refined, Nos. 29 and 27.....	3 1/2
Best Refined, Nos. 21 to 29.....	3 1/2
Common, 1/4 less than the above.....	3 1/2
Best Bloom Sheets, Nos. 26 to 28.....	6 1/2
Best Bloom Sheets, Nos. 22 to 25.....	6 1/2
Best Bloom Sheets, Nos. 16 to 21.....	5 1/2
Common Red Plates, 8-10 to 16.....	9 1/2
Blue Annealed.....	2 1/2
Best Bloom, Galvanized, discount.....	50 %
Second quality, discount.....	55 %
Common, discount.....	60 %

**Wrought-Iron Pipe.**—There is no change whatever in this branch. Business is dull, but prices are firmly adhered to at the same discounts as quoted last, viz.: Butt-Welded Black Pipe, 27 1/2 @ 30%; Butt-Welded Galvanized, 17 1/2 @ 20%; Lap-Welded Black, 47 1/2 @ 50%; Galvanized, 32 1/2 @ 35%; Boiler Tubes, 47 1/2 %.

**Steel Rails.**—There is little of interest to report in this department, business being slow and irregular on a somewhat weaker market. It is difficult to give exact figures for any but small lots, because buyers of large lots obtain special quotations. There is no reason to believe that anything over \$33 at mill has been realized for 1000-ton orders, but there is room for the opinion that quotation has been shaded. In any event, small orders are readily placed at \$33.50, from which it is not unfair to assume that large orders can be placed on better terms, providing that deliveries are not too urgently required. We therefore quote \$33 @ \$33.50 at mill, according to quantity and quality.

**Crop Ends.**—There is some inquiry, and special makes of English or Belgian could find buyers at about \$21, but, owing to scarcity, sellers ask more money—say, \$22 @ \$22.50.

**Old Rails.**—There is no demand except for small lots, which may be quoted at \$22 @ \$22.50 for spot deliveries. Shipments from the South are offered at \$21.75 @ \$22, but there are no buyers at these figures, nor at anything near them, unless for very small quantities.

**Scrap Iron.**—The market is weak and lower. Choice No. 1 Wrought sells in small lots at \$23 @ \$23.50, but buyers are very careful in their selections. Cast Turnings offered at about \$11; Wrought do. at \$16.

**Nails.**—The good demand noted last week continues. Stocks are light, and manufacturers in this section find ready sale for all their product. Prices are well sustained, though no higher, viz., \$2.50 @ \$2.60, according to size of lot.

## Pittsburgh.

[Special Dispatch to *The Iron Age*.]

PITTSBURGH, PA., April 23, 1884.

The special meeting of the Western Nail Association to-day was devoted to discussions of the minor details of the pooling plan. Without entirely perfecting the agreement, the association adjourned to their regular meeting in May. A resolution endorsing the action of the manufacturers' committee in demanding a reduction in the wages of labor for next year was adopted unanimously.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., April 22, 1884.

The unsettled and unsatisfactory condition of the general Iron trade noted for some time past continues, and the prospect for an early improvement is not encouraging. Not only is the volume of business very much reduced as compared with what it usually is at this season of the year, but prices are irregular and unremunerative. The weather during the past week has been very favorable, and, with the exception of being a little cold for vegetation, all that could be desired. The country roads are in good condition, but business, as already stated, does not improve.

The first conference meeting of the Iron manufacturers and Amalgamated Association took place on Saturday last. The representatives of the Amalgamated Association submitted their proposition, which was last year's wage with a few unimportant changes. This was positively refused by the manufacturers, who in turn reported the old scale with a reduction of 10%, which was refused by the Iron-workers. Both sides refused to make concessions, and the conference adjourned without fixing any time for another meeting.

**Ore.**—The latest advices from the Lake Superior Ore region are that the market is steady, with upward of 2,000,000 tons contracted for. Prices are still quoted on a basis of \$6.25 @ \$6.50 for Republic, delivered on the dock at Cleveland. A good many contracts were made prior to the advance; one firm here is said to have contracted for 100,000 tons at the lowest price of the season.

**Pig Iron.**—The general position of this market remains much the same as noted in our last report; demand continues exceedingly light, consumers refusing to buy beyond immediate wants, and it looks as if the hand-to-mouth policy was likely to be adhered to for some time to come. The consumption here in Pittsburgh has fallen off somewhat recently and is unusually light for the season, as but few of the mills are running full, and until there is an improvement in the market for the products no change for the better in the raw material can reasonably be expected. Production continues light and stocks are very much reduced; but a small proportion of the fur-

naces west of the mountains are in blast, and those in blast are working on contracts, so that there is little or no "piling up."

We repeat former quotations:

Gray Forge Neutral..... \$17.00 @ \$17.50, 4 mos.

Red Short Mill..... 18.00 @ 18.50, 4 "

All-Ore Mill..... 18.50 @ 19.00, 4 "

Foundry Grades..... 18.00 @ 20.00, 4 "

Warm-Blast Charcoal..... 22.00 @ 25.00, 4 "

Cold Blast, Charcoal..... 20.00 @ 28.00, 4 "

Bessemer Iron..... 20.00 @ 25.00, 4 "

Common, 1/4 less than the above..... 20.00 @ 25.00, 4 "

Some furnaces still refuse to sell their best brands of Neutral Mill under \$18, 4 months, but consumers have no trouble in obtaining all they want at \$17.50, 4 months, which is now regarded as the ruling price.

**Muck Bar.**—Continues very dull, and prices are weak and drooping; offers to sell at \$31, 4 months, the lowest price touched yet, and at which it is claimed there is little or no margin for profit.

**Manufactured Iron.**—No improvement to note, and manufacturers generally talk discouragingly; not only is the demand light for the season, but prices continue unsettled and unremunerative. Trade has been very disappointing all spring, but a good summer trade would straighten matters out. Merchant Bars are still quoted at 1.75¢ @ 1.85¢, according to size and character of orders.

**Nails.**—The demand continues light for the season, but manufacturers are hopeful of an improvement later on. Large buyers are still holding off in expectation of lower prices, and, once they become reasonably assured on this point, a considerably increased demand, it is confidently expected, will follow. The indications are that there will be at least an average trade this summer, and, notwithstanding business is dull at present, manufacturers are all running their factories in expectation of an improvement in the near future. There is little or no stock in the hands of jobbers, who for some time past have been buying only as their immediate necessities required. We continue to quote at \$2.35, 60 days, 2% off for cash, in carload lots and upward, and 5¢ @ 10¢ per kg additional in jobbing way.

**Wrought Iron Pipe.**—In this, as in nearly all other branches of the Iron trade, business continues backward and disappointing, but hopes of an early improvement are entertained. Prices remain unchanged, as follows: Discount on Black Butt-Welded Pipe in carload lots, 30%; less than carload, 27 1/2%; on Galvanized, 20% and 17 1/2%. On Black Lap-Welded Pipe, carload lots, 50%; less than carload, 47 1/2%; on Galvanized do., 35% and 32 1/2%. Selected Pipe, or Pipe cut to specified length, discount per cent. less in the gross than on regular Pipe.

**Steel.**—The Merchant Steel trade continues unsatisfactory and unsettled, but few, if any, of the mills running full. Prices remain unchanged. Best brands Refined Cast Steel, 9 1/2¢; do. Crucible Machinery, 5¢; Bessemer and Open-Hearth do., 3 1/2¢ @ 3 1/2¢.

**Steel Rails.**—The market continues quiet and prices remain unchanged at \$35, cash, at mill, with a sale of 2000 tons reported. Both the mills here are still in operation, having had a good many orders booked for future delivery.

**Old Rails.**—There is still considerable inquiry for small lots, and with light offerings, the market is steady at \$23.50, at which the last sales reported were made. Old Steel Rails quoted at \$19 @ \$20.

**Railway Track Supplies.**—The demand for everything in this line continues light, while prices remain unchanged. Railway Spikes, 2 1/2¢, 30 days; Splice Bars, 1.75¢ @ 1.85¢; Track Bolts, 2 1/2¢ @ 3¢.

**Crop Ends.**—The last sale of American reported was at \$19, at which more are offered.

**Scrap.**—The Scrap market continues quiet. Sales of Wrought Scrap at \$20 @ \$21 1/2 net ton; Car Axles, \$29 @ \$30; Wrought Turnings, \$16 @ \$17; Cast Borings, \$13 @ \$14. Old Car Wheels appear to be scarce, with some inquiry; quoted nominally at \$19 @ \$20, gross.

**Window Glass.**—There is considerable inquiry, and the outlook is favorable for a good summer trade. Prices remain unchanged; discounts on Single Strength in carload lots, 60 and 20%; on Double, 70 and 50%.

**Coke.**—There has been little or no change in the situation during the past week. Business continues to be all that can be expected in view of the unsatisfactory condition of the Iron trade. No change in price; \$1.10 per ton, free on cars, at ovens.

**Coal.**—The continued suspension of river navigation for Shipping Coal has had a good effect, having stiffened the down-river market.

## Chicago.

Office of *The Iron Age*, 26 and 28 Clark St., Cor. Lake St., CHICAGO, April 21, 1884.

**Hardware.**—The market continues in the same condition as last week. Jobbers report a good demand, but still complain of low prices. Indeed, this seems to be the chief complaint in all branches of trade. Jobbers say that if they were receiving prices which would pay them for handling their goods, the present volume of trade would be satisfactory. Seasonable goods are the chief demand, while Heavy Hardware and Blacksmiths' Tools are on the increase. Anvils have had a steady call, which has nearly exhausted the supply. Barb Wire has recovered from the shock the recent advance produced, and is in greater demand than a week ago, at 5¢ and 5 1/2¢ for Four and Two Point respectively for Painted, and 1¢ extra for Galvanized, these prices covering only the most common manufactures. There are Special Wires, such as the Link and Sheet Iron Barb, which cannot be bought for less than 5 1/2¢ @ 6 1/2¢ in carload lots.

**Nails.**—The demand for Nails is steady, and varies with the weather rather than

with the effort of manufacturers to control prices by syndicate government. Those in this market who are interested in the movement to pool the product and increase the prices are very reticent regarding its success. We learn that the attempt has not met with the favor that was expected, and that this weak point has had an earnest effect upon consumers who were uncertain as to what course to pursue. The demand is confined to quantities of less than 50 kgs, which can be had at from \$2.50 to \$2.55, 2% to 60 days—a decline of 5¢ off per kg, with strong indications of still greater weakness.

**Ore.**—Nothing has occurred to change the status of the Ore market since our last report. The Republic Ore Company are quoting \$6.50 on dock at Cleveland, which has the effect of driving out of the market all those in this vicinity who contemplate buying at least, temporarily.

**American Pig Iron.**—The prospects in this market are less favorable than in the early part of the year. During January and February there was hope; to-day there is despondency in the trade. Producers and dealers alike complain of sales and prices. Since February there has been a decline of \$1 per ton on the strongest class of Iron, which is Lake Superior Charcoal, and the one quality upon which a decline was least expected. Some other brands which are more plentiful have suffered a still greater decline, and can be bought to-day at \$2 per ton less than three months ago. Notwithstanding these facts, there is being considerable Iron sold, but only for prompt consumption, in lots ranging from one to two carloads, and even less when shipping is not a consideration. Since the reduction in freights going east, some Charcoal Iron has found its way into latitudes heretofore excluded, which has helped to strengthen the market and sustain activity. A number of Charcoal furnaces are temporarily out of blast for repairs in the Lake Superior district, but the supply continues to fully meet the demand. In Coke and Southern Iron there is the same feeling and plenty of stock on hand. Anthracite Irons are not coming into the market, it being generally conceded that they are crowded out by the Coke Irons from the Mahoning and Shenango valleys. For carload lots, 4 months, at \$21; Ohio Standard Black Band, No. 1, \$21 @ \$22; Southern, No. 1, at \$20, and No. 2 at \$19; Silvery Soft at \$19 @ \$21; Anthracite, No. 1, at \$22, and No. 2 at \$21.

**Scotch Pig.**—There is nothing of importance in this branch. The market remains quiet and weak, with no signs of improvement. We continue our quotations of last week—\$26.50 for Summerlee and \$27 for Glengarnock.

**Merchant Steel.**—The demand for Steel is almost exclusively for the extra brands. In the lower grades business is so thoroughly demoralized that it is impossible to arrive at a price or determine the condition of the market. For the best quality of Tool Steel the demand for the past week was pretty fair, as was also the demand for Machinery and Plow Steel. Speaking of the market as a whole, the demand is slow, prices exceedingly weak and no visible indications of improvement. We make the following quotations for the Best Refined grades:

Best Refined Cast Tool Steel..... Per pound.

Crucible Cast Machinery Steel..... 6 1/2 @ 6 1/2

Open-Hearth Machinery Steel..... 5 1/2 @ 5 1/2

Bessemer Machinery Steel..... 5 1/2 @ 5 1/2

Open-Hearth Spring Steel..... 5 1/2 @ 5 1/2

Toe-Call Steel..... 5 1/2 @ 5 1/2

**Nails**.—Are steady at \$2.50 for carloads, usual deduction for cash. Job lots, 10¢ @ 15¢ higher.

**Merchant Iron**.—Bar Iron is steady but dull at \$1.85 for round assorted lots. Bolts, \$2.80 @ \$3 for Square and Hexagon Heads; Spikes, \$2.35; Splices, \$1.90.

**Coal**.—We quote Fancy Lump Coal at \$3; Common, \$2.50; run of mine to manufacturer, \$1.50 @ \$1.75 at mills.

**Coke**.—We quote at \$2 @ \$2.20 at furnace; Foundry Coke at 8¢ @ 10¢ bushel.

**Barbed Wire**.—We quote Four-Point Galvanized, 6¢ P lb.; Cambria Link, 6¢ P lb.

## Cincinnati.

APRIL 21, 1884.—**Pig Iron**.—Dealers report inactivity in the market, transactions being confined entirely to the supply to meet present needs of consumers, while the desire on the part of producers and holders is to see prices remain at former quotations. It is thought that the present conditions of the market will obtain through the year. Quotations for the past week:

Hanging Rock Charcoal Foundry, No. 1.	\$22.00 @ \$22.50
Tennessee and Alabama No. 1.	19.50 @ 20.00
No. 2, less.	
Hanging Rock Coke, Best No. 1.	20.00 @
No. 2.	19.00 @
Hanging Rock Coke, Good.	19.00 @
No. 2.	18.00 @
Alabama, Virginia and Tennessee.	19.00 @
No. 2.	18.00 @
American Scotch Hanging Rock, No. 1.	20.25 @
No. 2.	19.25 @
Others, No. 1.	19.00 @
No. 2.	18.00 @
Hanging Rock Silver Gray, No. 1.	19.75 @
No. 2.	18.75 @
Others, No. 1.	18.50 @
No. 2.	17.50 @
Car-Wheel, Cold-blast Charcoal.	30.00 @
Forge Charcoal.	20.00 @ 21.00
Forge, Coke, No. 1.	17.00 @ 18.00
Forge, Stonecoal, Nos. 2 and 3.	16.00 @ 16.50

No sales Scrap reported.

## St. Louis.

**HOFFER & Co.**, Pig Iron and Iron Ore Merchants, 318 Olive street, report to us as follows, under date of April 19, 1884: We have no change to note, either in prices or the condition of the market. We quote:

HOT BLAST CHARCOAL IRONS.

Missouri.	\$19.00 @ 20.00
Southern.	20.00 @ 22.00
Ohio.	24.00 @ 26.00

COAL AND COKE IRONS.

Missouri.	19.00 @ 20.00
Southern.	18.50 @ 19.50
Ohio.	21.00 @ 25.00

MILL IRONS.

Red-short.	17.50 @ 18.50
Neutral.	17.00 @ 18.00

CAR WHEEL AND MALLEABLE IRONS.

Missouri.	19.50 @ 21.00
Southern.	25.00 @ 28.00
Ohio.	25.00 @ 28.00

## Louisville

GEO. H. HULL & Co., Commission Merchants, report to us as follows, under date of April 19, 1884: The Iron market continues quiet. Sales are light, with very little disposition to book orders for future delivery. Furnaces generally are firm in price:

PIG IRON.

Southern Coke, No. 1, Foundry.	\$18.50 @ \$19.50
No. 2.	17.50 @ 18.00

Hanging Rock Coke, No. 1, Foundry.

22.00 @ 23.50
21.00 @ 22.00

Southern Charcoal, No. 1, Foundry.

16.00 @ 18.00
15.50 @ 16.00

Southern Coke, No. 1 Mill, Neutral.

15.00 @ 15.50
15.00 @ 16.00

No. 2. " Cold-sh't.

15.50 @ 16.00
15.00 @ 16.00

Southern Charcoal, No. 1 Mill.

19.00 @ 18.00
14.00 @ 14.50

White and Mottled, different grades brands.

26.00 @ 27.00
22.00 @ 24.00

Southern Charcoal, other brands.

27.00 @ 28.00
23.00 @ 24.00

Hanging Rock, Cold-blast.

22.00 @ 23.50
20.00 @ 21.50

Warm-blast.

20.00 @ 21.50
18.00 @ 19.50

The prices current (prices paid by local dealers) for Rags, &c., are as follows:

CANVAS, LINEN.

PI.	\$1.34 @ 4¢
No. 2.	1.34 @ 4¢

WHITE COTTON.

PI.	\$1.34 @ 4¢
No. 2.	1.34 @ 4¢

WHITE, NO. 1.

PI.	\$1.34 @ 4¢
No. 2.	1.34 @ 4¢

WHITE, NO. 2.

PI.	\$1.34 @ 4¢
No. 2.	1.34 @ 4¢

SECONDS.

PI.	\$1.34 @ 4¢
NO. 1.	1.34 @ 4¢

SECOND WOOLENS.

PI.	\$1.34 @ 4¢
NO. 1.	1.34 @ 4¢

MIXED RAGS.

PI.	\$1.34 @ 4¢
NO. 1.	1.34 @ 4¢

GUNNY BAGGING.

PI.	\$1.34 @ 4¢
NO. 1.	1.34 @ 4¢

KENTUCKY BAGGING.

PI.	\$1.34 @ 4¢
NO. 1.	1.34 @ 4¢

STOCK.

PI.	\$1.34 @ 4¢
NO. 1.</td	



G. W. Nock, 142 Fourth street, Philadelphia, has issued a supplementary catalogue of Nickel-Plated Steel Key Blanks, showing the different styles which are manufactured by the Penn Lock Works, and for convenience giving a list of corresponding Keys of the principal makers.

## BUSINESS ITEMS.

The Parkin File Company, Cleveland, Ohio, have appointed T. P. Burke their direct representative in this city, at 100 Chambers street. This company are the manufacturers of a full line of Files.

The Attwell Manufacturing Company, of Cincinnati, Ohio, have established a New York office at 73 Gold street, where they will be represented by C. A. S. Fraser, who is authorized to give their best prices on the Attwell Burglar Proof Safe Lock and Ventilator, of which they are the manufacturers.

## New York Iron Market.

**American Pig.**—We hear of no large transactions whatever, the demand being very limited and mainly for lots of 100 tons and under. The starting of the Albany and Troy Stove foundries and the New England Nail factories has produced little effect upon the market as yet, most of the works in question having some stock of Pig Iron which was left on hand when the strike began, or else they made contracts for Iron some time ago which will now be delivered. As the deliveries of Iron by the harbor transportation agencies form a very good indication of the condition of trade, it may be well to mention in this connection that we are informed by persons engaged in the business that for several months barely half as much Iron has been moved as usual; but those who are receiving Iron desire it delivered as quickly as possible, thus showing the small stocks now being carried by consumers. Standard brands of No. 1 Foundry are reported in quite short supply, but prices are no better than they have been, and it is even intimated that slight concessions have been made to hold trade. No. 2 is in more abundant supply, and is a little easier, though we make no change in quotations. Mill Iron is offered quite freely, and prices are easier for even good brands, though the best brands are held firmly at full figures. The range of the market may be quoted about as follows for standard L-iron brands, tide-water delivery: No. 1 X Foundry, \$20 @ \$21, with retail lots and a few special brands selling at from 50¢ to \$1 75 ton higher; No. 2 X Foundry, \$19 @ \$19.50; Gray Forge, \$17.25 @ \$18.50. Outside brands, especially Virginia Irons, are offered at 50¢ to \$1 75 ton below these figures.

**Scotch Pig.**—Sales during the week under review were few in number and consisted only of small lots. Arrivals aggregated 1600 tons, which had been sold previous to shipment or afloat almost wholly. Prices are easier, and may be quoted as follows: Gartsherrie, \$22.50 from yard, \$21.25 to arrive; Shotts, \$22.25; Langloan, \$22 to arrive; Carnbroe and Glengarnock, \$22.50 from yard, \$22 to arrive; Coltness, \$22 @ \$22.50; Summerlee, \$21.75; Dalmellington, \$20.75; Clyde, \$20.50; Eglinton, \$20.25 to arrive.

**Bessemer Pig.**—No transactions are reported, though inquiries for foreign Bessemer have been made. It could probably be purchased at \$20 ex-ship, but buyers offer \$19.75, which importers cannot meet.

**Spiegeleisen.**—Sales of 2000 tons of 20% and 30% have been made since our last report at \$28 and \$32 respectively. Importers claim to be firm at \$28 for 20%.

**Bar Iron.**—The month of April has been a much better month for business than either of the two months preceding it, so far as volume is concerned, but prices have not been maintained, particularly for mill lots. Here and there a mill agent has taken a firm stand, and insisted that he will not reduce his rates below certain point, but prices generally have slowly receded. During the past week sales of Best Refined of undoubted quality have been made at 25 lb for car-load lots, delivered on dock. Other Iron has been sold at considerably less money. Some sales of mill lots of Common Iron are reported at 1.75¢, delivered in consumers' yard in this city. Western competition continues with unabated vigor, but the prospect of labor troubles in the West is looked forward to as a possible relief from this disturbing element, if freights are not advanced in the meantime. Store trade continues about as it has been, although some dealers report a month of considerably better business than its immediate predecessors. Prices are quotable as follows: Best Refined, at mill, 1.8¢ @ 2.05¢; from store, 2.1¢ @ 2.25¢; Common Iron, at mill, 1.7¢ @ 1.75¢; from store, 2¢ @ 2.1¢.

**Structural and Shaped Iron.**—New business is reported slow, builders being in no hurry to make contracts for Iron in the present condition of the market. We continue to quote: Angles, 2.4¢ @ 2.6¢ from store; Tees, 2.9¢ @ 3¢ from store; Beams and Channels, 3.5¢ on wharf for round lots.

**Plate Iron.**—Trade is quiet, and but little movement is to be noted. We quote nominally as follows: Common or Tank, 2.4¢ @ 2.6¢; Refined, 2.7¢ @ 2.75¢; Shell, 3¢; Flange, 3.5¢ @ 4¢; Extra Flange, 4.5¢ @ 5¢.

**Sheet Iron.**—A reasonable demand exists, but there is no special activity and prices are

not strong. Western mills are anxious sellers, and their prices are nominal. We quote Nos. 10 to 16, from store, at 2.8¢ to 3.1¢. For lighter sizes see our New York Wholesale Price List.

**Merchant Steel.**—No improvement in either business or prices is to be noted. Plates alone seem to be in fair demand. We quote as follows: American Tool Steel, 10 1/2¢, with a concession to large buyers; Crucible Machinery, 6 1/2¢ @ 7¢; Bessemer and Open-hearth Machinery, 3 1/2¢ @ 4¢; Tank Steel, 4¢; Boiler Plates, 4 1/2¢ @ 5¢; Extra for special sizes; English Tool, 15 1/2¢.

**Steel Rails.**—The only sale reported during the past week is one of 1000 tons. A rumor is current that a sale of 3000 tons, which was included in the quantity mentioned in our last report, was made on a basis of \$31 at mill by an Eastern company. This is denied by the company, who say that they sold the Rails at a price delivered at a New England point, and that their freight rate is only known to themselves, but it leaves them considerably more than \$31. Inquiries for summer delivery are increasing, and contracts for large blocks of Rails are now under negotiation. The outlook for the immediate future is pronounced very good under such circumstances, and agents of the various companies represented here feel sanguine over a possible upward movement in price. For later deliveries there is no such cheering prospect, but we hear of no lower quotation than \$33 at Eastern mill.

**Wire Rods.**—The buying movement seems to have subsided for the present, and few sales of Steel Rods are reported for the past week. Prices continue firm, however, at \$48 for future delivery, and \$50 and perhaps more asked for spot lots. The large buyers appear to be stocked up for the present, but there is no fear that they are as well stocked as they were a year ago, and consequently they are expected to enter the market from time to time hereafter, instead of holding aloof again for over a year.

**Old Rails.**—Not so many Rails were offered during the past week, but still prices were low. Sales to the extent of 800 tons are reported, namely, 500 tons at \$20, delivered at a near-by point, and 300 tons at \$20, f.o.b. cars Jersey City.

**Wrought Scrap.**—Very little is being done in No. 1 Wrought from yard, and prices are therefore nominal at \$22 @ \$22.50. Of Light Scrap 10 tons were sold, delivered at a point some distance away, which realized a price equal to about \$14.75 here.

The New York office of Messrs. Walbaum & Co., general merchandise brokers, making Metals, Iron Ores and Railroad Supplies their specialties, has been removed from 55 and 57 Pine street to 59 and 61 Pine street, where they will continue to be represented by Mr. Moreau Lieber.

## TRANSACTIONS ON THE NEW YORK METAL EXCHANGE.

We are reported the following transactions as having occurred on the floor of the Exchange from Wednesday noon of last week to Wednesday noon of this week:

WEDNESDAY, April 16.—Between Calls.  
100 tons Pig-Iron Certificates (No. 2), May, \$18.00  
100 " " July, 18.25  
10 tons Straits Tin, spot..... 1865  
25 " " April..... 1866

THURSDAY, April 17.  
10 tons Straits Tin, April..... 1866  
10 " " May..... 1866

FRIDAY, April 18.  
No transactions.

SATURDAY, April 19.  
No transactions.

MONDAY, April 21.  
300 tons No. 1 American Pig, Sept..... 19.37 1/2  
10 " Straits Tin, July..... 1865

TUESDAY, April 22.  
10 tons Straits Tin, May..... 1866  
25 " " ..... 1865  
20 " " June..... 1866  
20 " " July..... 1866

WEDNESDAY, April 23.—First Call.  
10 tons Straits Tin, July..... 1865  
10 " August..... 1865

The above sales include 200 tons of No. 1 Pig Iron at \$19.37 1/2; 200 tons of Pig Iron Certificates (No. 2) at \$18 @ \$18.25, and 180 tons of Tin at 18.5¢ @ 18.65¢.

## An Oil Gas Plant for a Lighthouse.

Plans for a very extensive oil gas plant for a lighthouse to be erected on Ailsa Craig, an immense rock lying at the entrance to the Firth of Clyde, have recently been adopted by the English Lighthouse Commissioners. For use in foggy weather, of which there is so much in that locality during the winter months, there is to be fitted up a large fog-horn to be operated by compressed air, the air being compressed by a number of gas engines. The works in Ailsa Craig will comprise a gas-house in which will be erected three of Keith's patent oil-gas producers and washers, with four retorts in each producer, making in all 12 retorts which are capable of producing in the aggregate 2000 cubic feet of gas per hour. The retorts are of simple construction, and are so arranged that the necessary heat can be raised within two to three hours, and the manufacture of gas be there continuously carried on at the rate mentioned during the longest fogs. A short distance from the gas-house will be placed two gas-holders, with cast-iron water tanks, having a combined capacity of 20,000 cubic feet. The gas-holders are connected

to the producers in the gas-house through 12 of Keith's patent oil-gas coolers placed outside. The gas produced from the oil being extremely pure, the scrubbing apparatus is of the simplest kind, and no purifiers are required.

The material employed for the generation of the gas is a partially-refined shale oil, technically known as blue paraffine oil, which costs in England, according to quality, from sixpence to ninepence per gallon. The oil produces a rich 50-candle standard gas, which is reduced, according to a method adopted by Mr. Keith, before it is consumed, by admixture with about half its volume of air by means of a meter mixer, so that the total quantity of stored gas available is 30,000 cubic feet. The meter mixer works automatically and accurately measures the proper quantity of air, which it thoroughly mixes with the gas, as the gas passes through the meter. The cost of the gas consumed on the rock will not exceed \$1.25 per 1000 cubic feet, and the gas, it is claimed, will be much purer and brighter than the best Scotch coal gas. In the engine-house, in connection with the fog-signaling apparatus, will be placed the gas engines, so that they may be ready to start at a moment's notice should a fog suddenly come on and obscure the light in the lighthouse tower overhead. The engines are eight in number, and are each of 5-horse power, the engines selected being of the Otto silent type. In ordinary circumstances, during a fog four of the gas engines will be kept running at a time, the other four being kept in reserve. The capacity of the gas-works is, however, ample to provide gas for all the engines and for the lighthouse as well; and when four engines are kept running, and the lights in the tower are kept burning, the gas stored in the gas-holders would be sufficient to last 30 hours, even if no more gas were made during the interval. The advantage gained by employing oil instead of coal for producing the gas is very great in such situations as Ailsa Craig, which is only accessible in fine weather for landing the necessary material. The oil also yields three times the volume of gas, with a much greater illuminating power, as compared with good cannel coal, where the amounts by weight are equal, or only one-sixth of the gas-producing material is required when oil is used instead of coal. It is expected that the works will be in operation some time during the coming summer.

## WASHINGTON NEWS.

(From Our Own Correspondent.)

WASHINGTON, D. C., April 23, 1884.

## LABOR BUREAU.

The bill providing for the establishment of a bureau of labor statistics, published in this correspondence some time ago, has passed the House of Representatives by the overwhelming vote of 182 yeas to 19 nays. The bill provides for a commissioner at a salary of \$3500, whose duty it shall be to acquire all useful information concerning labor, setting forth the relations of labor to capital, and the promotion of the material, intellectual, social and moral welfare of working men and women. It also provides for the force necessary to carry out the provisions of the law. In the consideration of the bill the discussion was mainly on the side of the bill. The chairman of the Committee on Labor explained the objects and benefits of the bill. Other speeches were made, all pointing to the advantages to accrue to the interests of labor by collecting statistics on that subject. Many amendments were offered, but were invariably voted down.

## TARIFF DECISIONS.

The monthly decisions of the Treasury Department have just been issued, containing in *extenso* the construction to be given to acts of Congress relating to the tariff. The following are the decisions affecting certain articles within the schedule of metals:

## BARREL HOOPS AT THE LOWER RATE.

The trial of the case of Leng *v.* Robertson, in the Southern District of New York, having sustained the claim of the plaintiff that certain iron barrel hoops cut to specific lengths, punched at one end, splayed or flared and corrugated, imported prior to July 1, 1883, were dutiable at the rate of 35 per cent. ad valorem, as manufactures of iron not otherwise provided for, the Secretary of the Treasury decided that the plaintiff was entitled to recovery of the duties which had been exacted in excess of that rate, and ordered that other similar suits be settled in the same way. The verdict accords with the principle enunciated in the decisions in several other cases.

## THE DUTY ON IRON CLIPPINGS.

In the case of an appeal of the Sanderson Bros. Steel Company from the decision of the collector at Boston, assessing duty at the rate of 1/10 cent per pound on certain iron clippings which the appellants claimed were dutiable at 1/10 cent per pound, the Secretary refers to a decision that certain iron trimmings, the waste of new iron, were dutiable at the rate of 20 per cent. ad valorem, under the provision in Schedule C for "metals unwrought" and declares that that decision applies with equal force to clippings or filings of new iron.

## PIANO-TUNING HAMMERS DUTIABLE UNDER THE METAL SCHEDULE.

An appeal from an assessment by the collector at Philadelphia of 45 per cent. ad valorem on certain piano-tuning hammers, the appellant claiming them to be dutiable at the rate of 25 per cent. ad valorem, under the provision for "musical instruments of all kinds," the rate fixed by the collector was affirmed, it having been decided that tuning hammers or wrenches form no part of the piano, and are neither in themselves musical instruments nor parts of musical instruments within the ruling in the court in the case of Foote *v.* Arthur. Being articles composed partly of metal, which are not specifically enumerated in the tariff act, they are dutiable at the rate of 45 per cent. ad valorem.

## SAW PLATES NOT SHEET STEEL.

The Secretary of the Treasury having sustained the appeal from the assessment by the

collector at New York of duty at the rate of 45 per cent. ad valorem on certain steel saw plates, in his decision declares the opinion that the article is provided for in Schedule C, act of March 3, 1883, and subject to duty according to value as claimed by the appellants. The appraiser in this case reported that the article in question was band-saw steel, 12 1/2 m. long, 127 mm. wide and 1/8 mm. in thickness, tempered and finished on the surface after having been rolled expressly for band-saws, and that it was not the sheet steel of commerce.

## THE MAIN BREECH-LOADING RIFLE.

The 6 1/2-inch breech-loading rifle contracted for by the Ordnance Department, and which is now being cast at the South Boston Iron Works, is reported to the Chief of Ordnance as in a state of satisfactory forwardness, and its completion is promised by the first of June. The gun is constructed chiefly of Witworth's fluid compressed steel. Its completion and test are events in ordnance improvement awaited with much interest by military men and engineers.

## A NOVEL VIEW OF THE TARIFF QUESTION.

George M. Landers, who represented the Meriden (Conn.) district in Congress for several terms, as a Democrat, and who is one of the large manufacturers of the State, in talking about the tariff question said, "It is, of course, to my interest to favor a high protective tariff, but, when you come to look at the matter in a business-like way, there are other considerations which concern us at home. We do not wish foreign manufacturers to come in, to the exclusion of profitable employment of our own capital and labor, nor is it policy to keep up duties at a rate which would stimulate new industries, and thus by competition force down prices, and with it the wages of labor. All things are relative, and while the purchasing power of high wages may not be any greater than lower wages and cheaper cost of living, still workingmen feels better with five dollars in his pocket than with three. As far as this affects the farmer or the merchant it is all the same, as he makes relatively more. Therefore, I, as a manufacturer, do not object to a moderate reduction as a means of home protection any more than would I wish to see such a thing as free trade. One protects at home and the other from abroad. The manufacturing power of this country is fully up to present demands of the home markets. This, as we all know, is the cause of business depression and the downward tendency of prices. I think this phase of the tariff question should be considered as well as the other. Our economic conditions need thoughtful consideration from the standpoint of our needs among ourselves. As the discussion has commenced, it would be well enough for some of our law-makers to look at the matter in this light."

## A COMPROMISE PROPOSED.

The agreement of the Pennsylvania Democratic Representatives in Congress to compromise on a modified reduction of duties, provided the other side would agree to an abandonment of the horizontal reduction plan and the repeal of internal taxes except on spirits distilled from grain, has been very carefully canvassed, and its friends are more confident than ever that this will be the basis of a settlement of the tariff controversy within the party lines.

## THE COMING SILVER INFLATION.

April 18.—The House Committee on Coinage yesterday, by a vote of 5 to 3, instructed Mr. Lacy to report favorably his bill to prohibit the issue of Treasury notes of less than \$5, and to provide for the issue of \$1, \$2 and \$5 silver certificates. A clause in the original bill, providing for a suspension of silver coinage whenever the standard silver dollars in the Treasury not held for redemption of silver certificates of the denominations of \$1 and \$2 shall exceed the sum of \$20,000,000, was stricken out.

## THE AMERICAN EXPRESS STEAMSHIP COMPANY.

April 21.—On motion of Mr. Morrison an order was made in the House to-day providing for evening sessions until further notice for general debate on the tariff bill. The House went into Committee of the Whole (Mr. Cox, of New York, in the chair) on the tariff bill, and Mr. Wellborn (Tex.) continued the speech he began last week. The measure, he said, was not an effort to readjust the many incongruities in the present tariff system, but a step in a policy which looked to the reduction of all duties to a revenue standard, and for that reason met with his approval. Protection, he argued, laid a destructive burden on all the agencies of commerce, and was a monopoly of the worst form. Under protection Congress was converted into a scene of unseemly strife between wrecked monopolies for an unjust share of the favoritism of the Government. It was an illegitimate and pernicious use of the right of taxation. It would be difficult to find in the whole range of the English language more hypocritical words than "incidental protection." He protested against this fraud in the use of language. If protection were good, right and Constitutional let it stand on its own merits, and not lean on something so respectable as revenue. Mr. McKinley (Ohio) criticised the provisions of the bill. Some of the articles of imported merchandise, he said, can better stand a reduction of 20 per cent. than others. A reduction of 20 per cent. will destroy some of the great manufacturing industries of the country. The only persons, he continued, who demand the reduction of the tariff were the members of the Free Trade Club of Brooklyn and New York. Mr. Herbert (Ala.) argued in favor of the bill. At the conclusion of his speech the committee rose and the House went into Committee of the Whole on the Pension Appropriation bill.

Gen. Luis Bogrand, President of Spanish Honduras, has sent an agent to this country to invite American capitalists to make investments in that Republic. By way of inducements, the Honduras Government offer large grants of agricultural, mineral and mahogany lands to parties who will spend money to develop them. Besides, all articles of machinery or food for workmen will be admitted free of duty. The lines of industry specially favored by the Government are cane planting and sugar refining, stock raising and mining, though any industry

Mexico, by the Secretary of the Treasury of that Government, giving certain instructions with regard to consular invoices of merchandise destined for the several ports of entry in that country. The decree is dated February 10 last, and says in order that the several sections of the tariff law of November 8, 1880, may be properly complied with, "that consular invoices and applications for the dispatch of merchandise shall contain the name, material and class of the merchandise specified in conformity with the tariff; the quantity, weight, length, width and number of pieces, &c.—expressing, for greater certainty, when it can be done, the number of the section in which the merchandise is comprehended; without admitting on any account, in lieu of the specification required by the law, a reference to samples of goods glued, sewed or in any manner attached to or inclosed in the invoices, to the end of avoiding doubts or arbitrary interpretations and the dangers inherent to the easy substitution of one sample for another."

## FOR A UNIFORM SYSTEM OF BANKRUPTCY.



## Our English Letter.

(From Our Regular Correspondent.)

LONDON, ENGL., April 7, 1884.

THE WEEK

has been a quiet one in a general way, and the position is not widely different from what it was at the date of my last letter. Trade and commerce, as a whole, are not flourishing, in the ordinary sense of the term, but the aggregate turnover is no doubt heavy, and it is not unlikely that there is more pessimism professed than is warranted by actual facts. There are branches of trade in which great dullness undoubtedly prevails, yet there are many others in which fair returns are being secured, even if on more onerous terms and with much more labor than was the case in the prosperous times of bygone days. We are doing more work for our money, but if we can still manage to secure a net 15 or 20 %, we may hope to prolong our commercial existence for many years yet to come. The old 100 or even 50 % days are of the past, but with an enlarged turnover a smaller percentage of profit may mean quite a respectable net income at the end of the year. Competition on all sides has necessarily limited the number of those who run up a fortune within a few weeks or years; but, under normal conditions, John Bull has much vitality left in him yet, and he will not fail to render a good account wherever he is allowed "a fair fight and no favor." According to our fair-trade friends, however, we are not permitted to have a fair fight; consequently, we are complaining of dullness and depression, while on all sides industries in rivalry of our own are springing up and flourishing. At the same time, and despite these drawbacks, I am one of those who believe that certain of the advantages of Great Britain cannot be overpowered or superseded, and, come what may, I should be prepared to bet on the old country in the long run. If I were asked, indeed, I should be of opinion that some of your Eastern manufacturers may (or may not) have rougher obstacles to overcome even than this old Kingdom, although nobody is a firmer believer than myself in the great future of the United States. I make no allusion whatever to the tariff herein, because it seems to me that fiscal tariffs or arrangements of whatever kind play but a very small part in the operations of the great ebb and flow of trade which we all so imperfectly comprehend at the present time. Just now, for instance, all the world is "in the dumps," so far as iron is concerned—neither the protected nor the free-trade countries differing much from each other. It is clear, therefore, that protection does not protect under all circumstances, nor does the freest of free trade avail against the course of bad seasons or overproduction. Briefly, it is abundantly plain that too much money has been sunk in almost all kinds of manufactures, and that the present bad feeling can only be alleviated by the gradual weeding out of those who have less money or less ability than their competitors. This process is now in progress and will make headway during the present year, by the termination of which we may possibly witness nearer approach to a balance between supply and demand all over the world.

**THE IRON AND STEEL INSTITUTE**  
Spring meeting will take place in London on April 30, May 1 and 2, and not on the dates mentioned in my last week's letter. The literature of the meeting does not promise to be of other than ordinary importance. Discussions will be carried on with regard to papers read at the last meeting, and it is not probable that more than two or three new papers will be read. The Bessemer medalists of the year will be Mr. E. Windsor Richards, the well-known general manager of Bolckow, Vaughan & Co., Middlesboro', and Mr. E. P. Martin, of the Blorenavon Works, South Wales. Both gentlemen have been zealous and successful in the furtherance of steel manufacture and deserve the rewards now promised to them. In respect of the autumn meeting of the Institute, new difficulties seem to have cropped up since my last, and the latest news is that the gathering will be held at Chester. Why at Chester I am quite unable to explain, seeing that it is a sleepy, old-world city, possessing nothing interesting in the shape of manufacturers or anything else, save its cathedral, its famous old walls, and a busy railway center. It may be, of course, that Chester has been selected on account of its proximity to Crewe, where there are the large steel and engineering works of the London and North Western Railway Company, under the excellent management of Mr. Webb, who has made a high reputation for steel boilers, &c. It is also possible that Chester has been chosen because it is an easy distance from Liverpool, Birkenhead or Manchester—or (shall I say it?) because it is near to some of the prettiest of the North Wales scenery. The "true inwardness" of the decision not to visit Sheffield has yet to be revealed, but it is whispered that the manufacturers of that town did not warmly reciprocate the advances of the Institute, and took no organized steps to give the visitors a proper welcome. It is also whispered that many of the Sheffields declared they would not throw open their establishments on the occasion—indeed, one large employer in the electroplate branch publicly expressed the hope that the exclusion would be general. I feel certain that most of the manufacturers would have taken a proper and generous view of the situation—still, under the circumstances, one need not be surprised that the council of the Institute should have selected Chester.

### THE IRON MARKET

is still without other than minor changes, the trade being very quiet in all directions, albeit not appreciably worse than at the date of my last report. The business doing on export accounts appears to be tolerably well maintained, but it is chiefly in respect of the commoner qualities, and runs largely on raw or partly manufactured materials. Generally speaking, however, the foreign and Colonial demand is not brisk, and the current shipments are to a great extent the outcome of the very low prices now obtaining. The home market is still dull, although the exceptionally fine weather is not without a

certain amount of benefit to a few industries, and affords promise of a good season to the farmers. It is to be hoped that this promise may be realized, and that a good harvest may at last set the great agricultural industry again on its feet. For the present the raisers of stock—lamb, &c.—are doing fairly well, and there are everywhere indications of good hay and fruit crops. At Glasgow the warrant market has been almost inanimate, the margins of the week having been of meager proportions, the closing price having been 42/- per ton. Shipments last week compared well with the corresponding week of 1883, but the total to date is behindhand. Despite the reduced production the quantity in store is gradually growing larger, so that the statistical position is anything but satisfactory. Of the total now in the Glasgow warehouses of Messrs. Connal, warrants are in circulation for about 561,000 tons, while of the total stored by the same firm at Middlesboro' warrants cover 54,140 tons. At Middlesboro' prices have been fairly steady on the basis of 37/3 @ 37/6 for No. 3. The official returns for March show that the total production of pig iron in that month was 216,000 tons, as against 237,000 tons in March, 1883. The number of furnaces at work was 102, as compared with 120 in the same month last year. The decrease in stocks during the month was about 5000 tons, or much less than had been anticipated. The local consumption has evidently been largely diminished, otherwise the stocks must have been lowered more than has actually been the case. On the West Coast hematite pig iron is quiet and without features to note, the general quotation for mixed lots in usual proportions being about 47/- per ton. In the other smelting districts crude iron are dull, but numerous inquiries are about in the anticipation of the quarterly meetings. The Lilleshall Company, it may be noted, have now started their new basic steel works, at which they will produce mild qualities of billets, slabs and the like. Crawshay Brothers' steel works at Cyfarthfa are also approaching completion, and will be started at any early date. For spiegeleisen and ferromanganese the call is only on an indifferent scale. As regards heavy manufactured iron, reports are anything but cheerful, many of the works in the North of England being obliged to stop for want of orders for ship-plates, angles and other kinds of shipbuilding iron.

In the wire trade one strike at Warrington is still unsettled, although the men elsewhere are working at the reduction. The demand for fencing wire is poor, and competition very keen. In galvanized iron there is no quotable alteration in values, and the majority of the producers are making short time. Ordinary finished iron is unaltered, but weak, and in but very moderate request. Pending the quarterly meetings both producers and consumers are disposed to hold back, there being an impression that the "list" houses may possibly lower marked bars by 10/- per ton. Whether or not this course be adopted, however, it is abundantly plain that such a change would have no material effect upon the iron market in general. With the demand at its present limp condition no such variation in the prices of a class of iron which is less used every succeeding year could possess real importance. Marked bars no longer rule the market, in fact, and they are certainly no criterion of the general range of price. It is possible, of course, that any considerable reduction in marked bars might press rather hardly upon the best grades of unmarked iron for a short time, but the difficulty would speedily rectify itself, as it has done on several occasions of recent years. Meantime quotations are very irregular, and are scarcely likely to be amended by this week's gatherings. Sheets are a shade steadier, for one reason already mentioned in these columns, but the amount of business on hand is not large. Iron rails are quiet, the only sales reported being of small lots of light sections for the Colonies. Old rails are in a little better request, but stocks are low and prices nominal at about 60/- @ 62/6, f.o.b., for D. H. Heavy wrought scrap is neglected, prices ranging from 47/6 to 50/- per ton, f.o.b., for selected lots. Freight rates are steadier, and rates are higher in some instances, owing to the difficulty of obtaining return cargoes at remunerative rates. For pig iron, by ordinary steamers from Glasgow to New York, the rate is about 6/- per ton. By sailing vessels from the Clyde, freights for pig iron include the following: Montreal, 12/6; New Orleans, 15/; Portland, 13/; Providence, 12/6; San Francisco, 20/. In respect of the British Channel ports I am advised as under by Edwardes, Robertson & Co., Cardiff: "The shipments from this channel to the United States during March show a marked falling off, and at present there is very little doing except in tin plate, and even in this there has been a very great decrease as compared with previous months. The freight market rules at 10/., 10/6 for berth steamers, but 13/6 was paid this month for coal hence to New York. For the Southern ports inquiries have ceased."

Steel remains in the same quiet state as when last alluded to in this report. There is no activity in any branch, although many houses are fairly employed. Old railway leaf-spring steel is nominal at 70/- per ton, c.i.f., United States ports. Crop ends are scarcer, and several lots have been taken up at 51/- @ 52/6 per ton, f.o.b., Welsh ports. Steel rails are reported a shade better, owing to the placing of several orders within the past 10 days or fortnight. The combination is said to work satisfactorily, but, so far as I can learn, it has not yet been subjected to anything like a severe test. For ordinary flange rails of 50 lb per yard and over the price is £4. 18/6 per ton, and 40 lb to 45 lb sorts, £5. 8/6, with lighter sorts dearer and firmer in the same ratio.

### SCOTCH PIG IRON

has been very quiet, closing rather in favor of sellers. The actual business doing is limited, and investors seem to be holding back from warrants quite resolutely. The number of operative furnaces is 93, as against 110 a year ago. In Connal's stores the quantity is 594,259 tons, as compared with 584,014 tons this date 1883. Last week's shipments were 2490 tons better, but there is a

net decrease to date of 9399 tons, while the imports of Middlesboro' pig into Scotland have increased by 10,079 tons.

### MIDDLESBORO' PIG IRON

has been fairly steady, on the whole, but it is anticipated that values will recede a shade at to-morrow's meeting, owing to the disappointing nature of the March statistics, which had been awaited with exceptional eagerness as a means of testing the effects of the operation of the restriction of production. I give below these figures in full. Prices are now on the basis of 37/3 @ 37/6 for No. 3, and G. M. B., f.o.b., at makers' wharves in the Tees, are:

No. 1 Foundry	41/6	Mottled	35/6
" 2 "	39/6	White	35/
" 3 "	37/3 @ 37/6	Refined metal	34/
" 4 "	36/6	Kentledge	33/
" 4 Forge	35/	Cinder	35/

The arbitration on the wages question took place on April 5th, and the award is expected within the next fortnight. The official returns of the Cleveland Ironmasters' Association for March are as follows:

### Make of Pig Iron.

	1884.	March.	Feb.
	Tons.	Tons.	
Make of Cleveland pig iron, whole district	140,933	149,886	
Make of other kinds of pig, including hematite, spiegeleisen and basic pig iron, whole district	75,628	71,375	
Total of all kinds, whole district	216,561	221,262	
No. of furnaces on Cleveland pig iron at end of month, whole district	68	71	
No. of furnaces on hematite, &c., at end of month, whole district	31	33	
Total	102	104	

### Stocks of Pig Iron.

	1884.	1884.	Mar. 31.	Feb. 29.	Tons.	Tons.
Makers' stocks Cleveland pig iron, whole district	209,014	214,438				
Makers' stores Cleveland pig iron, whole district	11,985	12,600				
Pig iron in public stores:						
The N. E. R. Co.'s stores	10,307	8,547				
Connal's stores	60,427	61,365				
Total	391,733	396,940				

### Shipments of Pig Iron from Port of Middlesboro'.

	1884.	1884.	1883.	March.	Feb.	Mar.	Tons.	Tons.	Tons.
Shipments foreign	47,953	33,621	40,532						
Shipments coastwise	32,912	33,389	34,763						
Total	*60,865	*69,860	75,295						

\* Including 1418 tons of pig iron other than Cleveland.

+ Including 1420 tons of pig iron other than Cleveland.

**HEMATITE PIG IRONS** are reported a shade steadier, recent advices from your market having had a tendency to encourage the hope that renewed buying from our makers may not impossible be a contingency of the near future. For mixed lots the quotation is as given above, and makers' brands of West Coast iron are:

No. 1.	No. 2.	No. 3.
Chester	49/	49/6
Londesdale	47/	47/6
Workington	47/	46/6
Lowther	47/	46/6
Distington	47/	46/6
Harrington	48/	47/6
Solway	47/	46/6
Maryport	47/	46/6

North of England brands are:

No. or quality.	Ordinary.	Bessemer.
1.	49/6	49/6
2.	47/6	
3.	47/	
4 Foundry.	47/	
4 Forge	47/	
Mottled	47/	

Last week's West Coast exports included 17,136 tons of pig iron and 3692 tons of rails.

### TIN PLATES

have grown firmer during the week, although quotations are mostly as before, and the amount of business actually done may not be large. The quarterly meeting of the trade will take place on Wednesday, at Birmingham, but is not likely to be signalized by any official change in prices. Makers are generally holding out for rather higher figures, very few sales being reported at 14/0 per box. The lowest rate is now 15/-, while steel plates with coke tinning fetch 16/3 @ 16/6 for I. C. There is a good call for 14/2 x 20 and for 28 x 20 sizes, the latter being firmest at the moment. Charcoal tin plates are quiet at 18/6 and upward, but are evidently being pressed out of existence by steel. For terne there is a decidedly better demand, and several good orders are stated to have been booked. Freights on tin plates from Liverpool to New York have been advanced by 2/6 per ton, making the present rate 7/6 per ton.

Part of the equipment of the Greely relief expedition are a number of ice saws which consist of blades of steel from 10 to 20 feet long, 3 inches wide,  $\frac{1}{2}$  inch thick, and with teeth 2 inches long and 1 inch deep. The handles at one end are long enough for four men to get a hand hold, while a crane of iron has an eye in it to which a rope can be secured to assist in jiggling the saw up and down. It frequently happens that a crew can see an ice floe





# WHOLESALE METAL PRICES, April 23, 1884.

## METALS.

**IRON.**—Duty: Bars, 8-10c to 1 1-10c per lb.; provided that no bar iron shall pay a less rate of duty than 35¢. Sheet, 11-12c to 1-5-10c per lb.; Band, Hoop and Scroll, 16 to 1-4-10c per lb.; Railroad Bars weighing more than 23 lb. per yard, 7-10c of 1¢ per lb.

### American Iron.

Foundry No. 1. \$2.00 @ 21.00  
Foundry No. 2. 19.00 @ 19.50  
Gray Forge. 17.25 @ 18.50

### Scotch Iron.

Carnbroe. 22.00 @ 22.50  
Coltness. 22.00 @ 22.50  
Shotts. 22.00 @ 22.50  
Glenarock. 22.00 @ 22.50  
Gartsherrie. 22.00 @ 22.50  
Langloan. 22.00 @ 22.50  
Stuimurie. 22.00 @ 22.50  
Dalmennington. 22.00 @ 22.50  
Eglinton. 22.00 @ 22.50  
Clyde. 22.00 @ 22.50

### Rails.

Steel, at Eastern mills. 33.00 @ 31.00  
Old Rails, T. 20.00  
Scrap. 22.00 @ 22.50

### Bar Iron from Store.

Common Iron:  
3/4 to 1 in. round and square. 2.10  
1 to 6 in. x 3 to 1 in. 2.20

Refined Iron:  
3/4 to 1 in. round and square. 2.10 @ 2.20  
1 to 6 in. x 3 to 5-10. 2.30 @ 2.40

Rods—9c and 11-15 round and sq. 2.30 @ 2.35c  
Bands—1 to 6x16 to No. 12. 2.50 @ 2.60

"Burden's Best" Iron, base price. 2.14c  
Burden's "H. B. & S." Iron base price. 2.14c  
Norway Nail Rods. 5.54 @ 6c

### Sheet Iron.

Common R. G. American American.

Nos. 10 to 16. 2.80 @ 3.10c  
17 to 20. 3.25 @ 3.50c  
21 to 24. 3.25 @ 3.50c  
25 and 30. 3.50 @ 3.75c  
27. 3.75 @ 4.00c  
28. 4.00 @ 4.25c  
B. B. 2d qual.

Galvanized, 10 to 20. 6.40 @ 5.40c  
Galvanized, 21 to 24. 6.40 @ 5.40c  
Galvanized, 25 to 30. 6.40 @ 5.40c  
Galvanized, 37. 6.40 @ 5.40c  
Galvanized, 28. 6.40 @ 5.40c  
American Russia. 6.40 @ 5.40c  
Russia. 6.40 @ 5.40c  
American Cold Rolled B. B. 5.40 @ 5.40c

### Iron Wire.

See Wire.

**STEEL.**—Duty: Ingots, Bars, Sheets, &c., valued at 40¢ per lb. less 45¢ ad. val.; valued above 40¢ and not above 70¢ per lb. 35¢ per lb.; valued above 70¢ and not above 100¢ per lb. 35¢ per lb.; valued above 100¢ per lb. 35¢ per lb. Extras.—Steel Bars, Rods, &c., cold hammered or polished in any way in addition to ordinary hot rolling. 35¢ per lb. in addition to above; Steel Circular Saw Plates, 1¢ per lb. in addition to the above.

### American Cast Steel.

For American Steel, see Pittsburgh quotations.

### English Steel.

Bent Cast. \$10.00 @ 17.50c  
Extra Cast. 10.00 @ 17.50c  
Circular Saw Plates. 10.00 @ 17.50c  
Round Machinery, Cast. 10.00 @ 17.50c  
Swaged, Cast. 10.00 @ 17.50c  
Best Double Shear. 10.00 @ 17.50c  
Blister, 1st quality. 10.00 @ 17.50c  
German Steel, Best. 10.00 @ 17.50c  
2d quality. 9.00 @ 17.50c  
3d quality. 8.00 @ 17.50c  
Shear Cast Steel, 1st quality. 10.00 @ 17.50c  
2d quality. 9.00 @ 17.50c  
3d quality. 8.00 @ 17.50c  
TIN.—Duty: Plates, Sheets, Tagger and Terne, 1¢ per lb.; Bars, Block and Pigs free.

Banca. 21.00 @ 21.50c  
Straits. 20.00 @ 21.00c  
English. 20.00 @ 22.00c  
Bar. 20.00 @ 22.00c

### Charcoal Tin Plates.

I.C. 10x14. \$5.62 1/2 @ \$6.50  
I.C. 12x12. 225 sheets. 5.62 1/2 @ \$6.50  
I.C. 20x28. 112 sheets. 12.00 @ 13.50  
I.X. 10x14. 7.00 @ 8.00  
I.X. 12x12. 7.00 @ 8.00  
I.X. 14x30. 112 sheets. 7.00 @ 8.00  
D.C. 12x17. 100. 5.50 @ 5.75  
D.X. 12x17. 100. 6.75 @ 7.00  
For each additional X add 10c.

### Coke Tin Plates.

Best. Ordinary. 15¢  
1/2 & 1/4 Warranted. 15¢  
1/4 & 1/2 Warranted. 15¢  
No. 1 Refined. 12¢  
No. 2. 11¢  
Extra Wiping. 11¢

### Tin Plates.

Prime Char. 2d quality Coke. \$7.50  
I.C. 14x30. M. F. @ \$7.50  
\$5 @ \$8.12 1/2 \$4.87 1/2 @ \$8  
I.X. 14x30. 22. 6.50 @ 6.75  
I.C. 20x28. 10.50 @ 10.75  
10.25 9.87 1/2 @ 10  
I.X. 20x28. 13.50 @ 13.50

### Tin Boiler Plates.

I.X. 14x26. 2 sheets for No. 7, 112 sheets. @ \$13.50  
I.X. 12x12. 112 sheets. 12.00 @ 13.50  
I.X. 10x14. 7.00 @ 8.00  
I.X. 12x12. 7.00 @ 8.00  
I.X. 14x30. 112 sheets. 7.00 @ 8.00  
D.C. 12x17. 100. 5.50 @ 5.75  
D.X. 12x17. 100. 6.75 @ 7.00  
For each additional X add 10c.

### PAPER STOCK, &c.

I.C. 10x14. \$5.00 @ \$5.25  
I.C. 14x28. 5.25 @ \$5.50  
I.C. 12x12. 5.25 @ \$5.50  
I.C. 10x30. 225 sheets. 8.25  
I.C. 20x28. 112 sheets. 10.75

### Rivets.

Iron and Tinned, new list, Dec. 10, 1881. 40¢  
In bulk, new list, Dec. 10, 1881. 40¢  
Copper Rivets and Burns. 45¢ @ 50¢

### Stove Bolts.

American Screw Co.'s. 60¢  
R. & E. Mfg. Co. 50¢

### GLASS.

Prices current per box of 50 feet.  
List, July 2, 1883.

### Sizes.

Single. 1st. 2d. 3d. 4th.

### Double.

Sizes. 1st. 2d. 3d. 4th.

### Stubs' Files, Tools and Steel, Gobet Swiss Files, Hollison's Patent Steel Music Wire.

# HERMANN BOKER & CO.,

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WARD & PAYNE'S Sheep Shears (see their large advertisement in this issue),

GARDNER'S 1881 Razors,

AND R. HEINISCH'S SONS'

Celebrated Tailors' Shears, Trimmers, Scissors, &c., Japanned and Nickel-Plated.

Every pair warranted.

GEO. WOSTENHOLM & SON'S, WADE & BUTCHER'S Pocket Cutlery and Razors.

JNO. WILSON'S Butcher Knives, Steels and Shoe Knives.

NEW ENGLAND CUTLERY CO.'S Table Cutlery.

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GUNS AND PISTOLS, ARMS AND AMMUNITION.

# MERWIN, HULBERT & CO.'S

AUTOMATIC

# Double-Action Revolvers.



Turning the Barrel on  
the Center Stem and  
drawing it forward ejects  
all the Shells.

38 and 44 Calibre.

Both Pocket and Belt  
Size.

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SO CLAIMED BY ALL USING THEM.

Being made of the very best malleable iron, cannot be broken; are heavily ribbed where needed; cannot be bent; easily put up; no cutting or grinding on small journal-pin, and can never, from use or wear, be forced from the track. Always working free and easy; no chocking or binding. The force applied to the door is always transferred to a roller. No joints to pound and jump over. A continuous track (merchant bar, 3-16 or  $\frac{1}{4} \times \frac{1}{4}$ ) is a cheap and desirable feature.

Special inducements to the trade.

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Filling Blower, Mitchell's Adjustable Socket  
Wrench, Skiff's Horseshoers' Vise.

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DARLING, BROWN & SHARPE'S

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WM. H. BELCHER,

89 Chambers Street, NEW YORK.

Catalogues for 1884.

Elizabethport Steam Cordage Co.,

MANUFACTURERS OF MANILA, SISAL AND TARRED

CORDAGE OF ALL KINDS.

BINDER TWINE A SPECIALTY.

46 South Street, NEW YORK.

## INDUSTRIAL ITEMS.

## NEW HAMPSHIRE.

The Nashua Lock Company are contemplating extensive improvements the present season, which will double their facilities.

## MASSACHUSETTS.

The following officers of the Gosnold Mills corporation, at New Bedford, have been elected: President, George Wilson; secretary and treasurer, John A. Bates; directors, George Wilson, George F. Kingman, Atwood Holmes, William G. Taber, Jireh Swift; superintendent, Henry Howard. Mr. Swift was elected director in place of Captain Joseph H. Cornell, who declined re-election on account of ill health.

The accident to the machinery of the Old Colony Iron Company, at Somersett, on the 12th inst., was not serious. Only the rocker arm of the engine was broken. Repairs were made and everything running full again by last Monday morning.

## RHODE ISLAND.

A building owned by the Rhode Island Tool Company, Providence, and leased to the Household Sewing Machine Company for japanning purposes, was partially burned on the 18th inst. Insurance on the building, \$5000, and on the stock belonging to the Household Sewing Machine Company, \$7000. These amounts, it is thought, will fully cover the losses.

## CONNECTICUT.

The Putnam Foundry and Machine Corporation have a capital of \$20,000, with stock all sold. They will erect at Putnam a foundry 50 x 100 feet, and a machine and wood-working shop 30 x 100 feet, two stories high. The president is Orrin Morse; vice-president and general manager, D. H. Billings; secretary and treasurer, W. R. Barber.

## NEW YORK.

A wire mill is to be erected on 118th street, near Avenue A, New York City, by Wolff, Kahn & Co. The mill will be located near the East River.

## NEW JERSEY.

It is reported that the stove works of Buckwalter & Co., of Royersford, Montgomery County, Pa., are to be moved to Elizabeth. This is done in order to avoid the hands lately employed at the works, who intimidate all workmen taken on since the strike.

## PENNSYLVANIA.

The old Snowdon Works, at Brownsburg, Fayette County, have been leased by Jacob Graser, A. J. Isler and John L. Snowdon, and will be run as a general machine and car shop, with steamboat machinery as a specialty. The works are very conveniently situated for this latter branch.

The rolling mill, pipe mill and sheet mill of the Reading Iron Works are still idle, but many of the men think they will resume this week.

Some slight trouble has been experienced with the employees at the works of the Pennsylvania Bolt and Nut Company, at Lebanon, but affairs are again running smoothly.

Maiden Creek Furnace, at Lenhartsville, the property of Jacob K. Spang, has been blown out for the purpose of putting in a new hearth and making some other necessary repairs.

The New York and Pennsylvania Coal, Iron and Coke Company, with a capital of \$3,000,000, was chartered this week. Its headquarters will be Johnstown.

The Greenwood Rolling Mill, at Tamaqua, has been abandoned, and will be dismantled.

Elmer Reed, superintendent of the Wheeler Iron Company's furnaces, informs us that, owing to the lining giving out, the Fannie Furnace will have to be blown out for repairs in a very few days. The other furnace, which has been banked up during the last few months, he thinks is past recovery, and will have to be shoveled out before anything can be done.—*Sharon Herald*.

Buckwalter & Co., proprietors of the Continental Stove Works, Royersford, whose molders have been on a three-months' strike, have leased a foundry at Elizabeth, N. J., where operations will be continued with new hands. The firm are determined not to submit to the strikers, who are charged with intimidating molders who were willing to work.

The Shenango Machine Works have secured the exclusive agency for and right to manufacture Brown's patent automatic skip, for filling blast furnaces. Its use is a matter of great economy in working, and it is rapidly taking the place of the old way of filling furnaces.

The Hollidaysburg Standard says: "The nail factory, of McLanahan, Smith & Co., which has been idle for several months, has again been put in operation. All the nailers who left in consequence of the suspension of work some time ago have returned."

The charter of the Connellsburg Gas Coal Company has been renewed. The company are not now actively engaged in business, having sold their Trotter plant to the H. C. Frick Coke Company, but they still own the Morrell and Wheeler property, which is leased for 20 years by the Cambria Company.

The West Lebanon Rolling Mill Company, Limited, have purchased the Harrisburg Chain Works, and will remove the entire establishment to Lebanon. About 50 hands will be employed.

The miners employed by the Westmoreland and Penn Gas Coal companies, at Irwin Station, about 1500 in all, are still on a strike. Their only objection now is a  $\frac{1}{4}$ -inch change of screen.

The changes at the plate mill of the Pottstown Iron Company are about completed, and the mill now ranks third in the United States for the manufacture of wide plate iron. The rolls are 112 inches wide. Formerly they were 72 inches. There is a mill at Pittsburgh with rolls 115 inches wide, and one at Baltimore perhaps wider. The machinery has been started and found to

run satisfactorily, and the mill will be started soon. Rumor has it that the same company will soon begin the erection of another mill, east of their present works, for the manufacture of bar and bridge iron.

The American Works, 72 ovens, on the Southwest Pennsylvania Railroad, near Stoner, have been purchased by the H. C. Frick Coke Company. The price paid was \$79,500. The works have been idle for some time, but will now be repaired and started up. The sale settles a couple of big lawsuits now pending.

The Scranton Steel Company exhibit at their New York office, No. 56 Broadway, a specimen of a 70-pound steel rail, which was subjected to a very severe test. A ball weighing 2240 pounds was dropped 55 feet on this rail, which rested on bearings 3 feet apart. Though the rail bent under this heavy blow, there is not the sign of a flaw about it. The carbon in this rail is 0.37 per cent. The usual rail test is a ton weight dropped 17 feet. A comparison of such a test with the one actually made will show the unusual strength of the Scranton rail.

Reports received at Reading on the 15th inst. from points along the East Pennsylvania Railroad between Toppen and Allentown, where great destruction has prevailed among the miners, indicated that work had been resumed in many mines, and that the remainder were preparing to go in operation. More confidence prevails among the working-men, who anticipate better wages and steadier work. There are about 800 miners in the district, many of whom have been working on half time at the rate of from 60 to 75 cents per day.

## PIITTSBURGH AND VICINITY.

Pittsburgh iron works experienced quite a scorching last week, small fires occurring at the Wayne Iron Works of Brown & Co., the Solar Iron Works of Wm. Clark & Co., and at the scrap iron yard of Koehler & Co., the latter blaze being communicated several times to Hussey, Howe & Co.'s mill.

## DELAWARE.

The plate-iron manufacturing concern of Seidel, Hastings & Co., of Wilmington, was dissolved on March 31. The Seidel & Hastings Company, a corporation of the State of Delaware, having purchased from Messrs. Seidel, Hastings & Co. the stock, property and assets of the Wilmington Plate Iron Rolling Mill, will hereafter conduct the business of the same.

## MARYLAND.

The Beall Engine, Boiler and Machine Works, at Cumberland—Merwin McKaig, proprietor—are running with a full force of hands. They are very busy on Mr. McKaig's improved "Mogul" horizontal stationary engine, the new Keystone roller mill and the Anderson self-lubricating mine carriage, as well as pulleys, shafting, mining machinery and gearing. The "Mogul" engine has been recently put on the market, and ranges from 10 to 100 horse-power. The Keystone roller mill is also new, and has many valuable improvements, its popularity being indicated by receipts in one day of orders for 11 of them. The Anderson mine wheel has been on the market a little over a year, and has given such excellent satisfaction that one coal company have ordered over 500 wheels, claiming that they save 75 per cent of oil.

## OHIO.

The report that the Crafts, Bessie and Winona furnaces are to be removed to Buchtel from their present locations is pronounced premature by the Columbus and Hocking Coal and Iron Company, who are the owners of these three furnaces, together with the Akron and Gore furnaces. The question of bringing these furnaces together at some favorable point in the Hocking Valley has been under discussion, but no definite conclusion has been reached as yet. For some time to come they will be operated at their present locations.

C. E. Harlan, of Woodsfield, has purchased, with others, the rights granted under Hoyt's patent for warehouse trucks. The trucks made under this patent are very convenient machines. The feature of novelty consists in an elliptical metal band which moves on pivots, set in the side of the truck a few inches forward of the legs, and which is so constructed that by the movement of a lever which is a continuation of the elliptical band below the right side of the truck it will embrace the box, barrel or other burden and hold it firmly in place. There are notches or slots in the sides of the truck by which, when the elliptical band is not in use, it may be dropped down below the level of the surface of the truck, and so be out of the way. The sides of the truck are connected by cross-pieces to accommodate barrels, round stoves and other curved objects. Movable teeth are fastened by bolts to the forward cross-pieces, which are designed to fasten themselves into the curved burdens, and which can be removed for the purpose of sharpening. By means of catches forming part of the forward cross-piece, square burdens can be held in place.

The charcoal kilns at the Iron River Furnace location are nearly completed, and the work of making coal for the new furnace will soon begin. The managers of this enterprise are displaying great energy in pushing it along, regardless of the unpromising state of the charcoal iron market. It would be a happy circumstance for their project if an improvement in prices should occur about the time their furnace is ready to go into blast. Such a stroke of good fortune is not wholly improbable.—*Marguerite Mining Journal*.

The Defiance Brake Shoe Company, of East St. Louis, were incorporated this week to manufacture and deal in Simonds' patent brake-shoe and other railway supplies; capital stock, \$100,000; incorporators, J. H. McLean, Arch J. Robertson and Charles H. Dismann.

A. M. & D. Gibson, of Chicago, will move into more commodious quarters May 1. They

are now busy on a number of improved drill presses.

The Gates Iron Works, of Chicago, will take possession of their new factory May 1.

The Western Stove Works have been organized at Peoria; incorporators, H. F. Ossenbeck, Jr., John W. White and J. F. Ossenbeck; capital stock, \$6000.

The Smith & O'Leary Steam Hammer Forge Works, of Chicago, are being run to their full capacity in order to meet the demand for vises, artesian-well tools and other forgings. Fifty men are employed.

The machine-shop outfit of the Prosser Twin Cylinder Car Company, consisting of lathes, planers, drill presses, vises, &c., has been purchased by Robert Tarrant, proprietor of the Marine Engine Works.

The Illinois Iron and Bolt Company, of Carpentersville, propose extensive improvements in their works this season. Another large water wheel will be put in, and to accommodate this the flume will be enlarged. The grinding and polishing departments will also be torn down and remodeled. The worn head-gates will be replaced by new ones, and the race-bank between the works and the dam for about half a mile will be strengthened.

The company have recently put in a milling machine and have added largely to their equipment in both tools and machinery. The cupola at these works has a capacity of about 17 tons per hour. The works are running full time in all departments, 100 men being employed. The company have recently sent a large number of copying presses to Genoa, Italy, and Rangoon, Burma. During 1883, 7500 tons of iron were worked up into copying presses, thimble skeins, jackscrews, blacksmiths' tools, sadirons, &c., at these works.

The losses by the burning of the Peoria Plow Works, on the 16th inst., are \$60,000 on the building and \$40,000 on the stock. The total insurance is \$45,000.

## INDIANA.

The Woolley Locomotive Electric Light Company, of Indianapolis, and the Ohio Power and Light Company of Dayton, Ohio, have consolidated, and on the 15th inst. perfected an organization to be known as the American Locomotive Electric Headlight Company. The capital stock is placed at \$6,000,000, and the following directors were elected for the first year: Louis Miller, J. A. Long, E. L. Buckcock, of Akron, Ohio; Leonard Moore, J. W. Carpenter, J. W. Stoddard, of Dayton; Geo. N. Wheeler, H. H. Fulton, M. N. Lynn, Indianapolis. This company control the Lynn and other valuable patents, and will at once begin the manufacture of electric headlight apparatus. Some of the directors are millionaires, and apparently there are ample means at the company's disposal to begin operations on a large scale.

## MISSOURI.

The extensive additions made to the mammoth iron works of Shickle, Harrison & Howard, at St. Louis, are about completed, and will require the employment of 400 additional workmen.

The corporate name of Buck's Stove Company, of St. Louis, has been changed to Buck's Stove and Range Company. They resumed operations on the 15th inst. with about half force.

The Laclede Car Manufacturing Company, of St. Louis, are erecting an addition to their works, 60 by 118 feet, in order to increase their manufacturing capacity.

The St. Louis Wire Mill Company are about purchasing a process for making wire without annealing, pickling or washing, thus saving fuel, labor and money.

The Midland Blast Furnace Company are tearing down their furnace in Crawford County, and will erect a new one with a view to improving their No. 1 foundry iron. The new furnace will be put in blast in about a month or six weeks. It will be in every particular exactly like the old furnace, which was erected in 1877, a peculiarity of which was that it was composed wholly of fire-brick. The old furnace was worn out from seven years' continuous use, having been out of blast in that time only long enough to make slight repairs.

## MICHIGAN.

The charcoal kilns at the Iron River Furnace location are nearly completed, and the work of making coal for the new furnace will soon begin. The managers of this enterprise are displaying great energy in pushing it along, regardless of the unpromising state of the charcoal iron market. It would be a happy circumstance for their project if an improvement in prices should occur about the time their furnace is ready to go into blast. Such a stroke of good fortune is not wholly improbable.—*Marguerite Mining Journal*.

## WISCONSIN.

The Dennett Harvester Company, Limited, of Milwaukee, have filed amended articles, increasing their capital stock from \$250,000 to \$500,000.

## NORTH CAROLINA.

The Marshall Foundry Company, Hickory, have been organized for the purpose of making part of the forward cross-piece, square burdens can be held in place.

## KENTUCKY.

W. C. Kelly & Co., of Louisville, are running their works to their full capacity, with orders booked to keep them busy for nine months. They have recently organized into a stock company, with a capital of \$100,000.

Mr. W. C. Kelly, who is president of the company, owning \$70,000 of the stock, and the balance being owned by M. J. P. Kelly, secretary of the company. The works have greatly been enlarged, and many valuable improvements in machinery adopted, which make it one of the most complete works of the kind in the country. They employ 150 men, and turn out about 2000 axes and hatchets daily.

The Lock and Hardware Manufacturing Company have been organized at Lexington.

B. F. Avery & Sons are about building another plow factory at Louisville.

The strike at Swift's Iron and Steel Works, at Newport, was ended on the 16th inst., the

men resuming work on their employers' terms.

## TENNESSEE.

The Knoxville Car Wheel Company are running extra time to fill large orders for wheels.

The Wason Car Works, Chattanooga, are increasing the supply of machinery.

The Southern Machine Company, of Bedford County, have been chartered.

The Knoxville Ice Factory is to have a new building with requisite machinery, costing \$20,000.

The Lagrange Iron Company are building a new furnace at Lagrange, which is to take the place of the old one. The stack will be 65 and the bosh 12 feet, and the furnace will be used in connection with two hot ovens and two blowing engines. It will be put in operation some time in June, and will turn out daily about 50 tons of choice hot-blast foundry irons.

The improvements made by General Wilder, of Chattanooga, in his turbine water-wheels in the last two years have created such a demand for them that he has recently erected works especially for their manufacture, which will be in full operation by May 1, and will be known as the Wilder Machine Works. The machine shop is 50 x 150; foundry, 50 x 80; blacksmith shop, 30 x 40, and warehouse, 30 x 40. The entire plant is fully equipped with all the modern improved machinery, with hoisting and running cranes, and every convenience for handling the wheels with the greatest economy. Orders are now on his books for the entire capacity of the works for the next four months, and, while some inquiries have been received from Northern States, up to the present time his entire capacity has been absorbed by orders from Kentucky, Tennessee, Georgia, Alabama and the Carolinas, to run the smallest cornmill up to some of the largest cotton mills that are now being erected in the South.

## COLORADO.

It is reported that a company with \$20,000 capital is to be formed in Denver for the manufacture of white lead. On account of the saving in transportation it is estimated that the white lead can be manufactured at Denver for about \$3.25 less than the present ruling car-lot Eastern prices. The principal persons interested in this scheme are George L. McQuown, Samuel Brown and E. J. Lopee.

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turers of the seaboard and the Western States. There is no reason why this rapid increase of tonnage will not continue hereafter; if it does, our present canals and railroads will not be able to meet the demands upon them."

## The New Orleans Exposition.

Favorable progress is being made in the preparations for the international exposition to be held in New Orleans, for which subscriptions have been made in this city to the amount of \$1,000,000. Director-General Burke reports as follows:

"Plans for the main building were opened to general competition. The building is handsome and commodious, being 1375 feet in length and 905 feet in width, affording 1,300,000 square feet of floor space, with convenient apartments attached for police, fire department, public comfort, offices, meeting rooms for various national organizations, and with a central musical hall capable of seating 11,000 persons, and a machinery hall 1375 feet in length by 250 feet in width. The main building covers 32 acres of ground. Two hundred and fifty thousand square feet of space have been reserved in the center of the building for foreign governments, and an equal amount for the United States Government and collective exhibits of the States and Territories.

"The applications for space from foreign

and United States exhibitors, eight months before the opening of the exposition, call for about 900,000 feet of exhibition space. Hence, although the exposition building is the largest ever erected except that of London, it is found inadequate to meet the demands. Eleven foreign governments have indicated their intention to participate, and I have been informed that many others have only delayed official action, awaiting information as to the progress of the preparations and importance of the event. Twenty-four States and Territories have applied for space, and I am informed that the delay in other States is due to the time of assembling of their respective Legisl

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Boston Hardware and Metal Prices..... 44The celebration of the first anniversary of  
the apprentices' night school at the Brooks'  
Locomotive Works was held recently and  
a number of prizes were distributed to those  
of the students who had been specially pro  
ficient in the different studies pursued. We  
need scarcely refer to the importance of  
Mr. Brooks' works in attempting to improve  
the general standing of mechanics, its grow  
ing appreciation being aptly demonstrated  
by similar efforts made in different parts of  
the country, and which, we are pleased to  
note, are all meeting with well-deserved  
success.The Webster aluminum patent, which has  
been making considerable noise in the news  
papers, is pronounced more complicated than  
existing methods for manufacturing alumina,  
and it starts with a manufactured product—  
alum—likely to cost more than other natural  
sources: bauxite, for instance, from which  
alum is made. It is possible that the Web  
ster patent has merits, but it appears to be  
tolerably clear that what is known of it is  
not new, and what is said in its praise is not  
true. A great prize will be drawn by the  
man who makes cheap aluminum, next to  
iron the most useful metal known in its pos  
sibilities, but Mr. James Webster does not  
seem to be the man who has made the dis  
covery.Mr. E. F. Lufkin, of Cleveland, Ohio, is  
about to erect a factory at South Chicago,  
Ill., for the manufacture of rules, which are  
used very extensively in the lumber busi  
ness. The factory, which will be 40 x 80  
feet, will employ some 25 skilled workmen  
and be fitted with six machines at the start.

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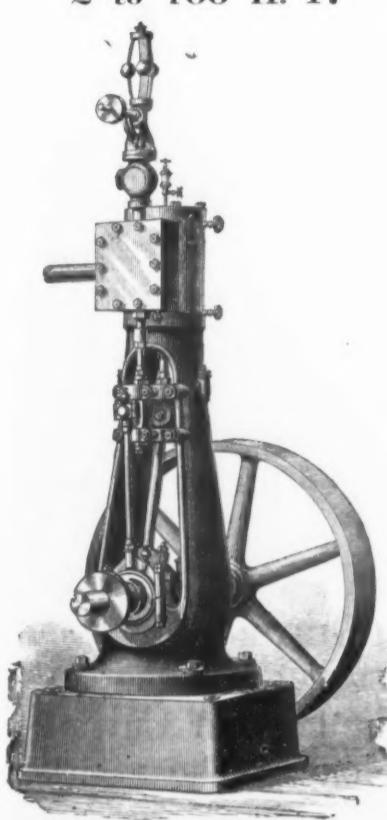
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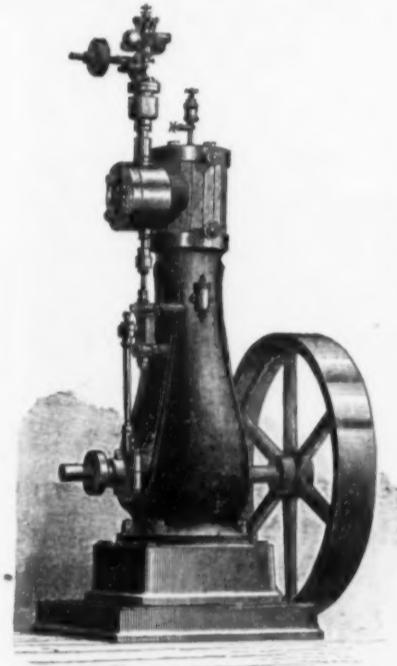
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3	3 1/2 x 5	250	1 12-16	20 x 4	367
4	4 x 6	200	1 15-16	24 x 4	522
5	5 x 6	200	1 15-16	24 x 5	557
6	5 1/2 x 7	180	2 7-16	32 x 4 1/2	889
8	6 1/2 x 7	180	2 12-16	32 x 6	977
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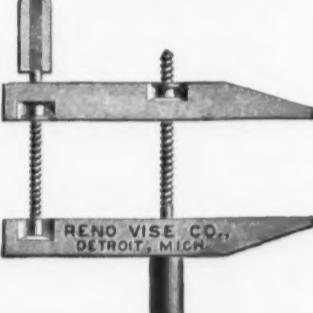
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**Traut's Patent Adjustable Beading, Rabbet and Slitting Plane.**

A short description of this article might be—"a half-chest full of tools, all in one;" for, as our ancestors made up kits of tools, a good-sized chest would have been required to contain the full variety embraced in this single tool, viz., 1, beading and center beading plane; 2, rabbet and filletster; 3, dado; 4, plow; 5, matching plane; and 6, a superior slitting plane, the whole being accompanied by seven beading tools ( $\frac{1}{8}$ ,  $\frac{3}{16}$ ,  $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$ ,  $\frac{7}{16}$  and  $\frac{1}{2}$  inch), nine plow and dado bits ( $\frac{1}{8}$ ,  $\frac{3}{16}$ ,  $\frac{1}{4}$ ,  $\frac{5}{16}$ ,  $\frac{3}{8}$ ,  $\frac{7}{16}$ ,  $\frac{1}{2}$ ,  $\frac{3}{4}$  and  $\frac{5}{8}$  inch), a slitting tool and a tonguing tool.

Perhaps no better understanding of the numerous features of this one plane can be had than by giving herewith a copy of the directions for its separate uses issued by the manufacturers. These will be clear to the reader if he refers to the annexed engraving as he reads:

**Dado.**—Insert a bit of the required width in the main stock, bring the sliding section of the stock snugly up to the left edge of the bit, and secure it on the arms by the brass thumb-screws. The deep gauge will serve best if placed at the left hand on the sliding section of the plane.

**Rabbet and Filletster.**—Insert bit as above, attach the fence to the arms by the upper holes in the same, and thus regulate the width to be cut. Use the depth gauge on right-hand side of the main stock.

**Beading and Center Beading.**—Insert beading tool in place of the bit, and otherwise use the plane in same form as for rabbet. For center beading the fence may be adjusted to allow of making a bead 5 inches inside from the edge of board if desired.

**Matching Plane.**—Insert the tonguing tool and use the plane in the same form as before. The depth of the tongue may be easily regulated by use of the brass gauge attached to the cutter. Boards varying from  $\frac{3}{4}$  to 1 inch in thickness can be matched in the center. The  $\frac{1}{4}$ -inch plow bit is used for grooving.

**Plow.**—Insert a bit of the required width, and attach the fence to the arms by the lower holes in the same. In using bits less than  $\frac{1}{4}$  inch in width, remove the sliding section of the plane from the arms.

**Slitting Plane.**—Insert the slitting blade into the slot on the right side of the main stock of the plane, and just in front of the handle, placing the steel depth gauge on the same spindle, and fasten the whole by use of the brass thumb-screw. In assembling the plane always insert the arm with the longest screw-thread nearest the handle, thus making a spindle for receiving the slitting blade on the right-hand side of the main stock. The peculiar form of the spurs in the base of the two sections to the plane gives three separate points which are interchangeable, or, if no spur is needed, all three of them can be withdrawn. Except for working across the grain the spurs need not be used.

The addition of a slitting blade to a tool of this character will be appreciated by carpenters who cannot have the use of circular saws in getting out window-stops and such other thin stuff as they need. The top of the slitting blade appears just in front of the handle in the engraving, and it is claimed that its position is such that great execution can be done with a moderate outlay of strength.

These tools are made by the Stanley Rule and Level Company, New Britain, Conn., who mention that by the use of special and approved machinery the greatest possible precision has been attained in the manufacture, and the working parts, being of metal, are all interchangeable. The tool is known in the trade as Plane No. 45, the retail price of which is \$8.

**The Needs of the Navy.**

The following letter from Admiral Simpson, chief of the Advisory Board, is of interest as showing what kind of armored ship the Board thinks of:

NAVAL ADVISORY BOARD,  
WASHINGTON, April 11, 1884.

**The Hon. William E. Chandler, Secretary of the Navy.**—Sir: Referring to the debate in the Senate on the amendments to the Naval Appropriation bill objection is raised by some Senators to granting additional vessels for the navy, on the ground that the cruisers asked for are not of such fighting quality as to match armored vessels of other nations, the inference being that if a bill were presented for the construction of an armored vessel it would meet with their approval.

The first Advisory Board was fully sensible of the need of armored vessels for the navy, but in consideration of the great need of cruisers to carry the flag abroad it recommended as the first step in "rehabilitating the navy" the construction of vessels to supply this the most pressing want of the service. Construction of armored vessels was confidently expected to follow in due order after a sufficient number of unarmored vessels should have been built to form a cruising force. It seems apparent that the building of armored vessels and of unarmored vessels was not proposed to be carried on simultaneously from a disinclination to call for very large appropriations.

For the purpose of conforming to the implied desires of Senators for armored ships, and from the fact that there is no doubt of the need of them, I respectfully recommend that the programme laid out by the firm of Advisors be so far departed from as to admit of having one armored vessel under construction constantly, even while the work of providing cruisers is in progress.

The length of time required for such constructions is from three to five years. They are very costly and will involve much study and careful preparation; besides, the selection of a type will be a matter requiring much deliberation. In relation to the last point—the selection of a type—I submit general dimensions and some particulars of two armed vessels which represent the most advanced ideas of the present day. One of

these would most probably be the character of the vessel that would be recommended by such a body as the Advisory Board.

Her Britannic Majesty's steamship *Impérieuse*, not yet completed, was commenced in 1881. She is called an armored cruiser, and is intended for service on foreign stations where fast unarmored ships may have to be opposed and where second-class ironclads may have to be engaged. Her dimensions are as follows: Length, 315 feet; beam, 61 feet; draft, 25 feet; displacement, 7400 tons; indicated horse-power, 8000; speed, 16 knots. The battery will consist of four 9.2-inch guns, each mounted in an armored barbette, and six 6-inch guns in broadside. The barbettes are arranged one forward, one aft and the others abreast of each other at the sides amidships: the heavy guns are thus situated at twice the height from the water that they would be in a turreted ship, and can be fired together in any direction. The speed and armament here described does not greatly exceed that of the *Chicago*, but the difference in displacement of 2900 tons admits of the following armor: Throughout the length occupied by the machinery and boilers (139 feet) the sides are protected by 10 inches of compound armor for a depth of 8 feet; the deck over this is 1 1/2 inches thick; bulkheads of plating 8 inches thick run athwartships at the forward and after extremities of the side armor, thus forming a citadel inclosing the machinery and boilers. Forward and abaft of the citadel, at the level of its lower edge, extends a protective deck 3 inches thick, sloping downward to the sides, as in the *Boston* and *Atlanta*. The barbettes are 17 feet in diameter, and are armored with 8 inches of steel, which protects the machinery for turning, elevating and loading the gun, and an armored chute leading to below the armor deck makes the passage of ammunition safe and rapid. The pilot tower is protected by 10 inches of armor. Contrasting the protection afforded by the armor above stated with the vulnerability of the *Chicago*, the advantage of the increased displacement of the *Impérieuse* becomes apparent.

**Porter's Window & Door Screen Corners.**—PAT. JULY 27, 1880.

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These tools are made by the Stanley Rule and Level Company, New Britain, Conn., who mention that by the use of special and approved machinery the greatest possible precision has been attained in the manufacture, and the working parts, being of metal, are all interchangeable. The tool is known in the trade as Plane No. 45, the retail price of which is \$8.

These instances are cited to show that a board cannot, except after the most careful study and examination, decide upon even the size and general dimensions of an armored vessel best suited for our purposes.

Therefore, in suggesting the form for an act of Congress which will best carry out the recommendation I make in this communication, and estimating the time required for completing the vessel as three years, I would propose that the authority should be given somewhat in the following form, namely:

For the construction of one armored vessel not exceeding 7500 tons displacement, \$1,000,000; such vessel to be constructed under the same conditions as prescribed for the construction of the steel cruisers,

# THE METAL WORKER PATTERN BOOK.

BY A. O. KITTREDGE.

## THIRD EDITION NOW READY.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 500 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting; and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

**G H K**, of Fig. 426, is presented one of the sets of conditions which necessitate a change of profile, in either the horizontal or raking molding, in order to accomplish a miter joint at the point indicated by **I II** in the plan. In other words, the conditions are such that with a given profile, as shown by **A'** in the raking molding, the horizontal molding forming the return will require to be modified, as shown by the profile **A''**, in order to form a miter upon the line **I H** in the plan; or, if **A''** is established, **A'** will have to be constructed to correspond with **A''**. The reason for this is quite obvious. The distance across the raking molding at right angles to its lines is greater than the corresponding distance across the return molding at right angles to its lines; therefore the projection in the cornice, as shown by the profile **A'**, must be distributed through a smaller space than is shown in the profile **A''**. In this problem we assume that the pitch of the raking cornice **B C** is established and that the profile **A** is given, and from these parts it is required to develop the modified profile. We have the choice of placing the normal profile in the horizontal return and making the raking profile correspond with it, or of placing the normal profile in the raking molding and making the profile of the horizontal molding agree with it. Although the principle upon which these operations is performed is identical in both, the demonstration will be made clearer if each is fully illustrated independent of the other. In this problem and the following one, therefore, we show the several steps necessary to take in modifying the profile, and in cutting the several patterns required to form the structure indicated by the elevation and plan. First we will assume that the normal profile occurs in the raking cornice, and that the horizontal profile is to be modified to suit it. We then proceed as follows: Draw a representation of the normal profile in the raking cornice, as shown by **A'**, placing it to correspond to the lines of the cornice, as shown. Draw another profile corresponding to it in all parts, directly above or below the foot of the raking cornice, in line with the face of the new profile to be constructed, placing this profile **A** so that it shall correspond with the lines of the horizontal cornice. Divide the profiles **A** and **A'** into the same number of parts, and through the points thus obtained draw lines, those from **A'** being parallel to the lines of the raking cornice, and those from **A** intersecting them vertically. Through these points of intersection trace a line, which gives the modified profile, as shown by **A''**. Then **A''** is the profile of the horizontal return, indicated by **G H I F** in the plan. It is also the elevation of the miter line **I H** of the plan for the several patterns involved. We therefore proceed as follows: At any convenient point at right angles to the lines of the raking cornice lay off the stretchout **M N** of the profile **A'**, through the points in which draw measuring lines in the usual manner. Place the T-square at right angles to the lines of the raking cornice, and,

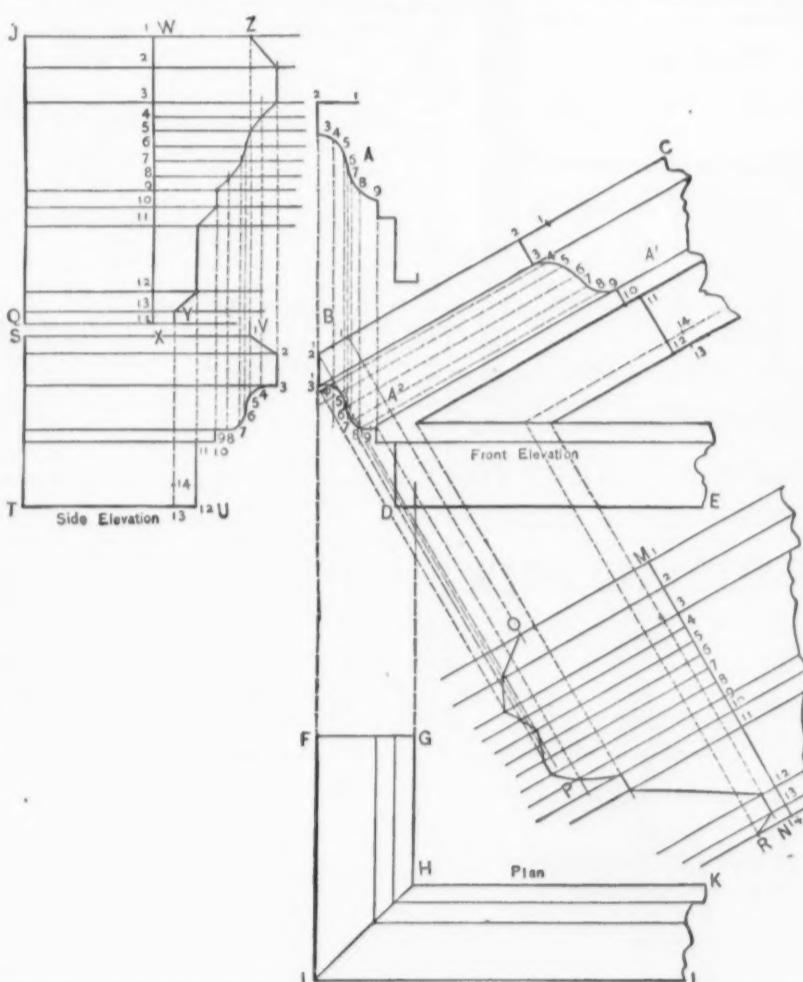


Fig. 426.—To Ascertain the Profile of a Horizontal Molding Adapted to Miter with a Given Inclined Molding at Right Angles in Plan, and the Several Miter Patterns Involved.

The specimen page here shown is from the last division of the book, entitled "Pattern Problems," and which embraces more than one-half of the entire work. It shows the manner in which practical questions are treated. The list of problems demonstrated is very extensive, and embraces almost everything of common occurrence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything, from a simple miter to the most complex problems, so arranged as to meet his requirements without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable

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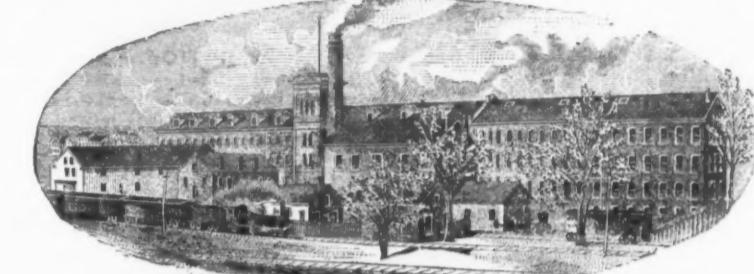
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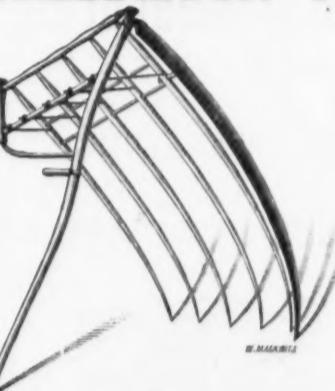


Fig. B.  
Figure B shows the Creedmoor Fastening applied to Five-Fingered Dutch Bow Cradle.

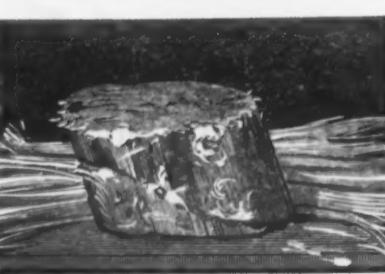
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Fig. A.  
Figure A shows the Creedmoor Fastening applied to all styles of Cradles.

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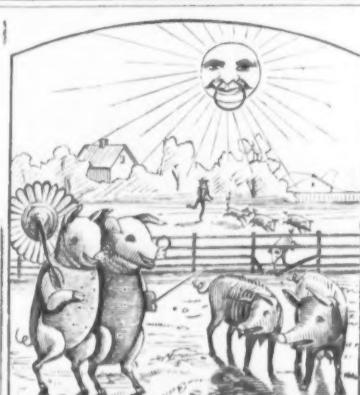
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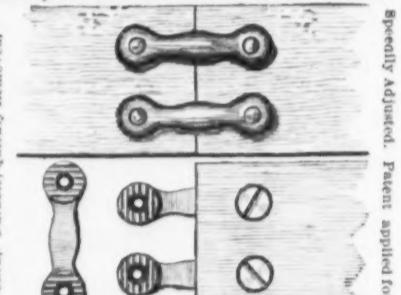
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**Pattern Problems.** 161  
**G H K**, of Fig. 426, is presented one of the sets of conditions which necessitate a change of profile, in either the horizontal or raking molding, in order to accomplish a miter joint at the point indicated by **I H** in the plan. In other words, the conditions are such that with a given profile, as shown by **A'** in the raking molding, the horizontal molding forming the return will require to be modified, as shown by the profile **A<sup>2</sup>**, in order to form a miter upon the line **I H** in the plan; or, if **A<sup>2</sup>** is established, **A'** will have to be constructed to correspond with **A<sup>2</sup>**. The reason for this is quite obvious. The distance across the raking molding at right angles to its lines is greater than the corresponding distance across the return molding at right angles to its lines; therefore the projection in the cornice, as shown by the profile **A<sup>2</sup>**, must be distributed through a smaller space than is shown in the profile **A'**. In this problem we assume that the pitch of the raking cornice **B C** is established and that the profile **A** is given, and from these parts it is required to develop the modified profile. We have the choice of placing the normal profile in the horizontal return and making the raking profile correspond with it, or of placing the normal profile in the raking molding and making the profile of the horizontal molding agree with it. Although the principle upon which these operations is performed is identical in both, the demonstration will be made clearer if each is fully illustrated independent of the other. In this problem and the following one, therefore, we show the several steps necessary to take in modifying the profile, and in cutting the several patterns required to form the structure indicated by the elevation and plan. First we will assume that the normal profile occurs in the raking cornice, and that the horizontal profile is to be modified to suit it. We then proceed as follows: Draw a representation of the normal profile in the raking cornice, as shown by **A'**, placing it to correspond to the lines of the cornice, as shown. Draw another profile corresponding to it in all parts, directly above or below the foot of the raking cornice, in line with the face of the new profile to be constructed, placing this profile **A** so that it shall correspond with the lines of the horizontal cornice. Divide the profiles **A** and **A'** into the same number of parts, and through the points thus obtained draw lines, those from **A'** being parallel to the lines of the raking cornice, and those from **A** intersecting them vertically. Through these points of intersection trace a line, which gives the modified profile, as shown by **A<sup>2</sup>**. Then **A<sup>2</sup>** is the profile of the horizontal return, indicated by **G H I F** in the plan. It is also the elevation of the miter line **I H** of the plan for the several patterns involved. We therefore proceed as follows: At any convenient point at right angles to the lines of the raking cornice lay off the stretchout **M N** of the profile **A'**, through the points in which draw measuring lines in the usual manner. Place the T-square at right angles to the lines of the raking cornice, and

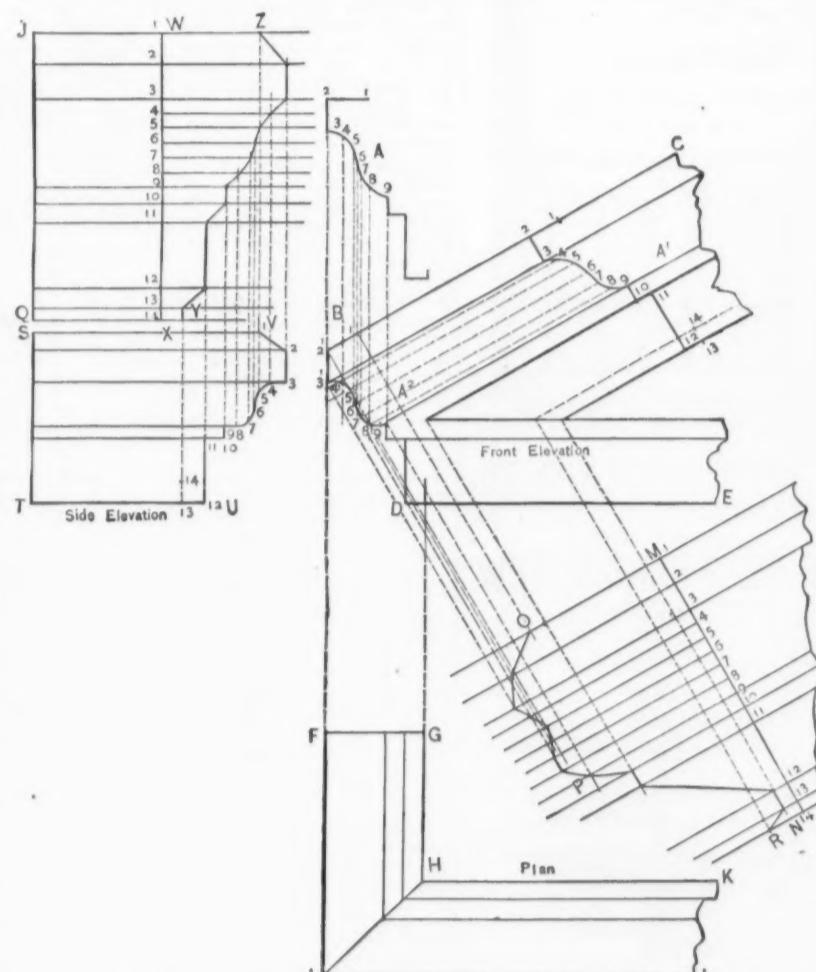


Fig. 426.—To Ascertain the Profile of a Horizontal Molding Adapted to Miter with a Given Inclined Molding at Right Angles in Plan, and the Several Miter Patterns Involved.

The specimen page here shown is from the last division of the book, entitled "Pattern Problems," and which embraces more than one-half of the entire work. It shows the manner in which practical questions are treated. The list of problems demonstrated is very extensive, and embraces almost everything of common occurrence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything, from a simple miter to the most complex problems, so arranged as to meet his requirements without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable

comments it has called forth, prove that it fully meets the want it was intended to supply.

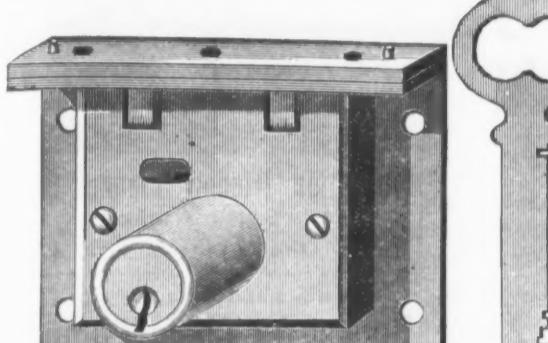
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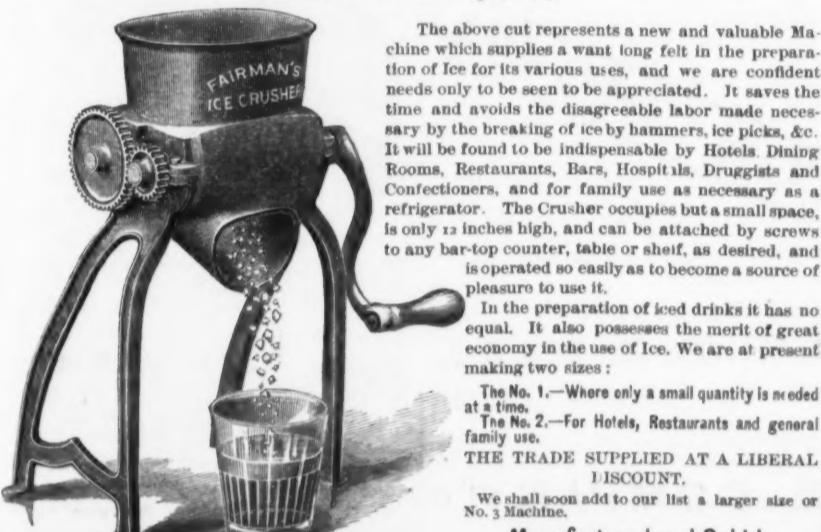
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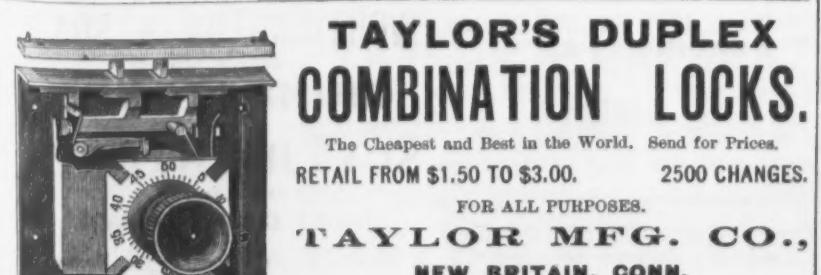
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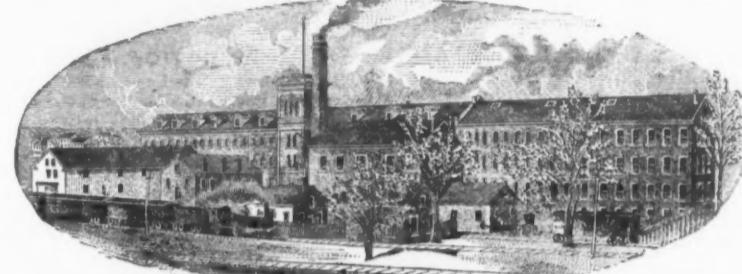
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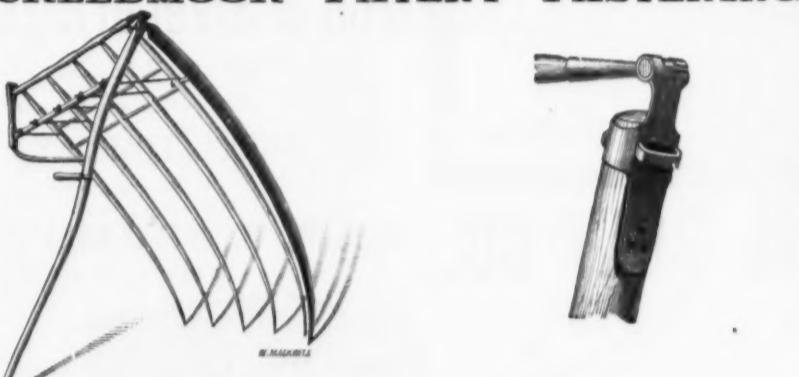


FIG. B.  
Figure B shows the Creedmoor Fastening applied to a Five-Fingered Dutch Bow Cradle.

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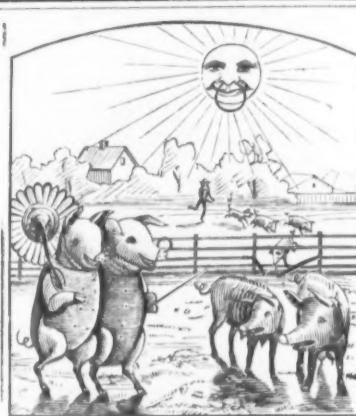
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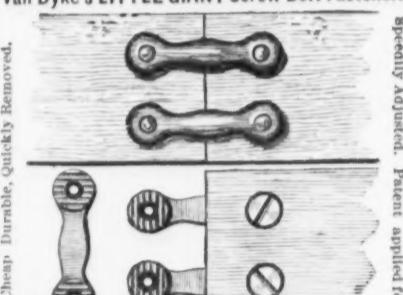
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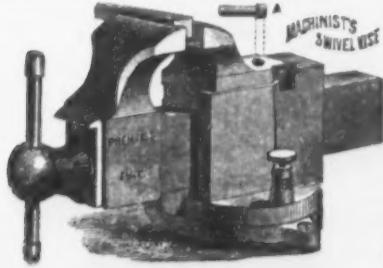
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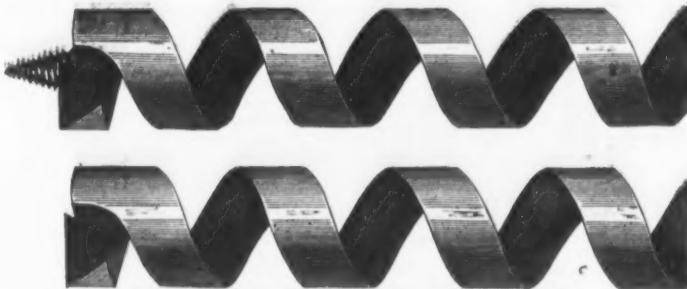
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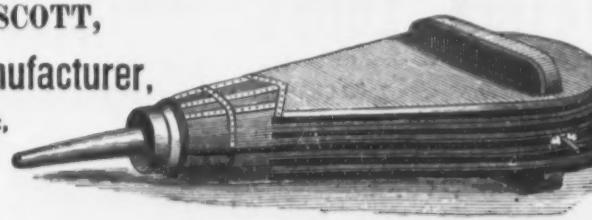
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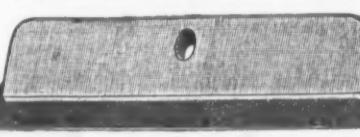
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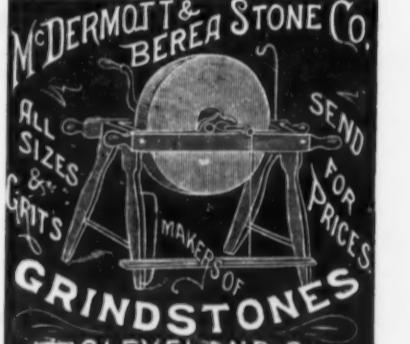
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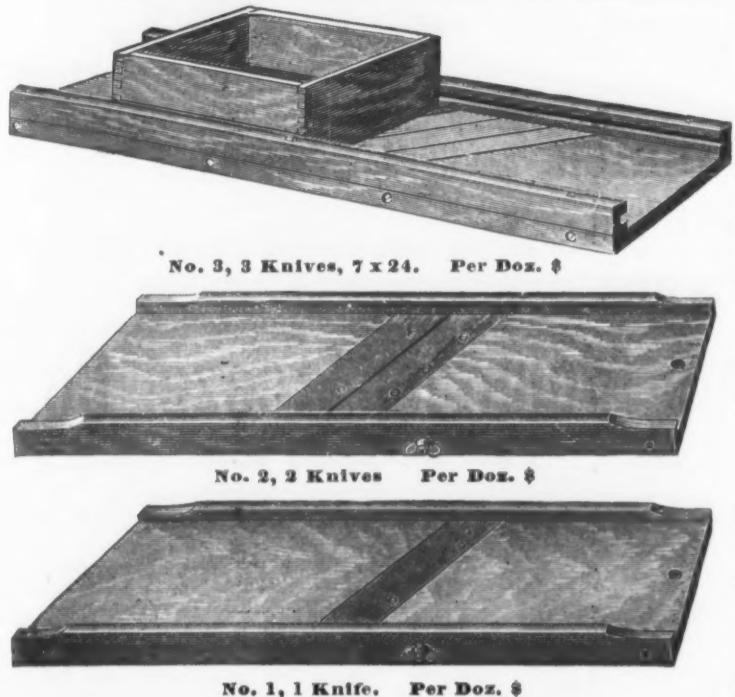
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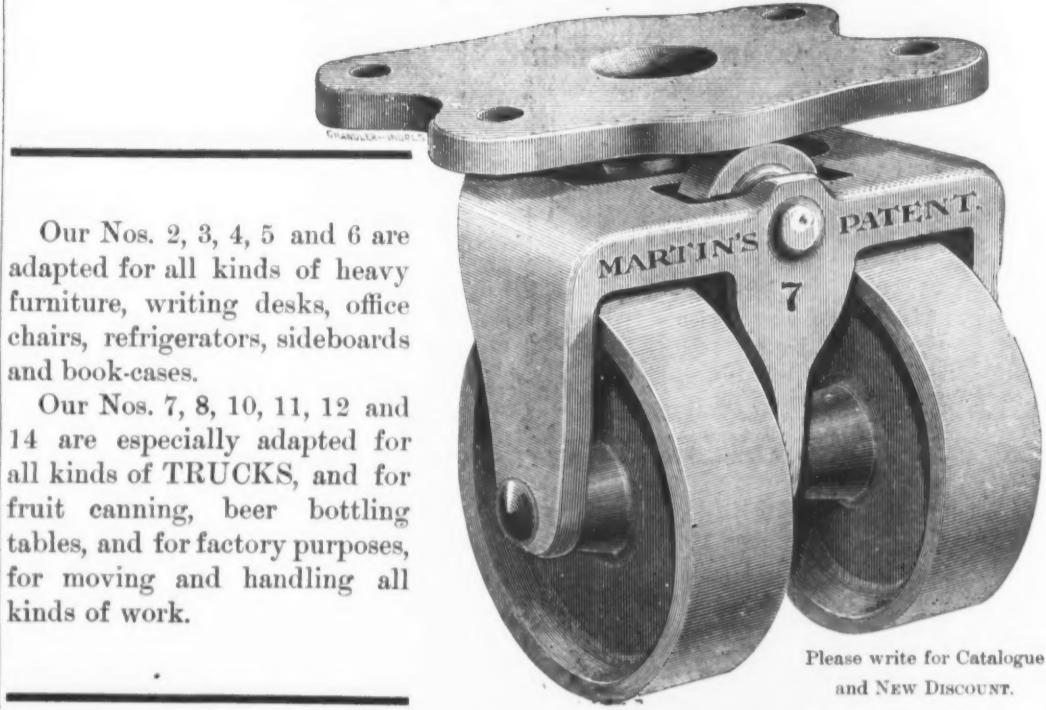
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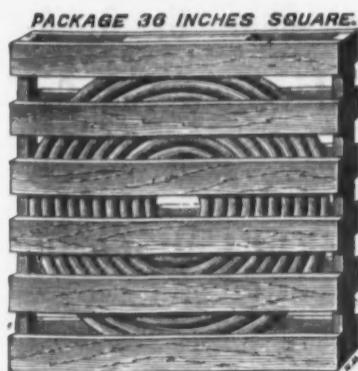
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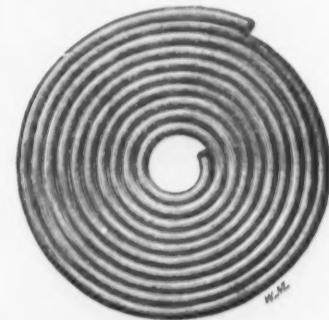
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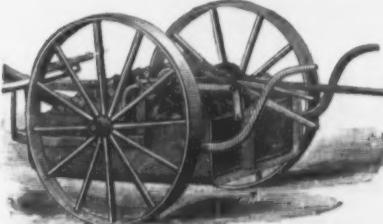
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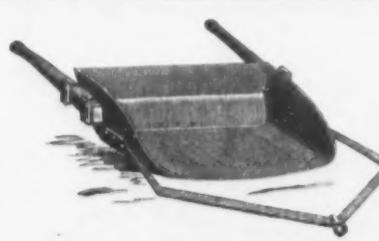
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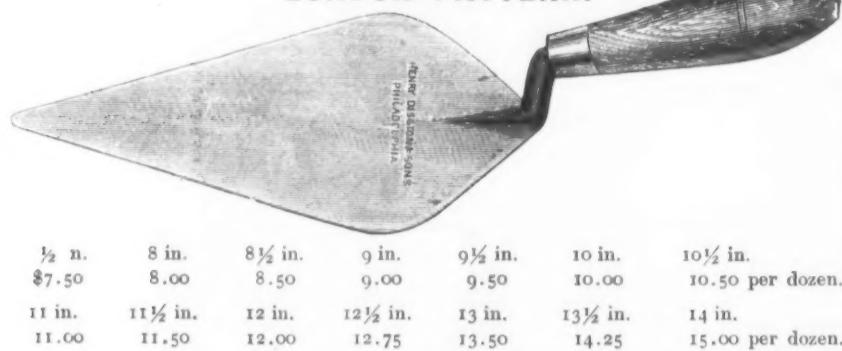
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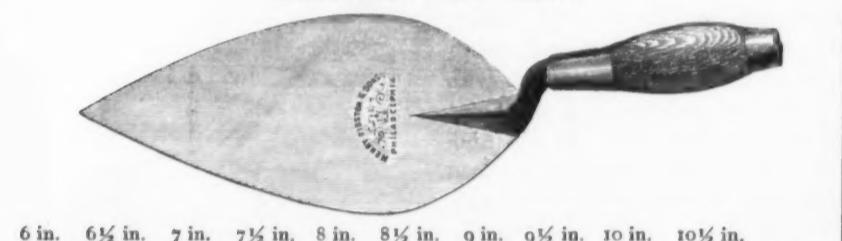
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11 in.	11 1/2 in.	12 in.	12 1/2 in.	13 in.	13 1/2 in.	14 in.
\$13.00	13.50	14.00	14.75	15.50	16.25	17.00 per dozen.

BOSTON PATTERN.



6 in.	6 1/2 in.	7 in.	7 1/2 in.	8 in.	8 1/2 in.	9 in.	9 1/2 in.	10 in.	10 1/2 in.
\$5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00	9.50	10.00 per dozen.

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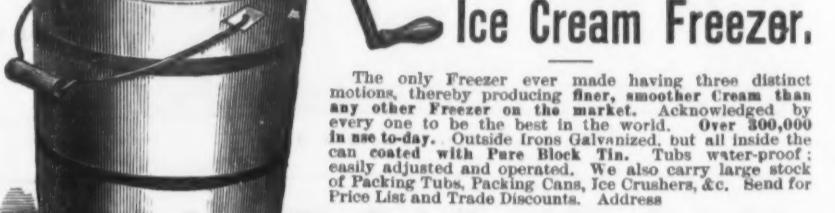
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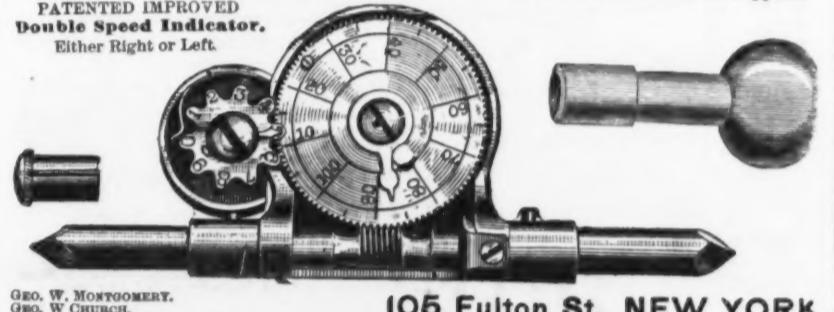
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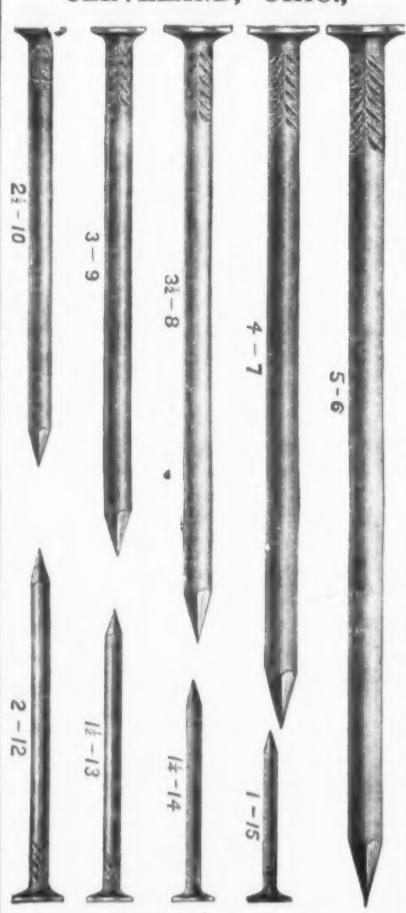
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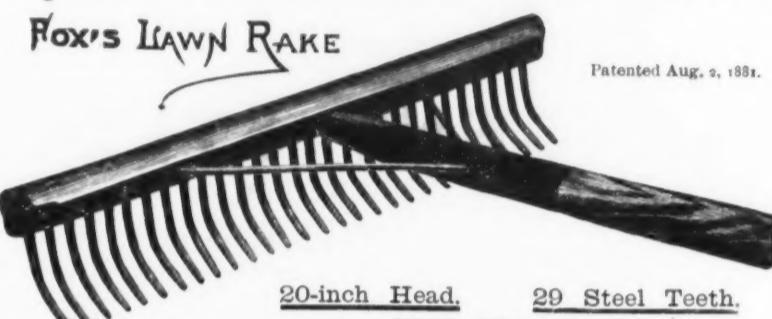
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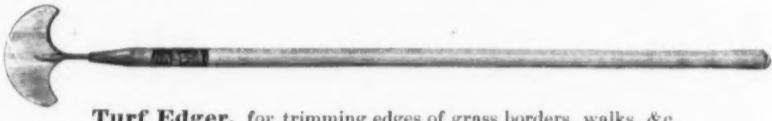
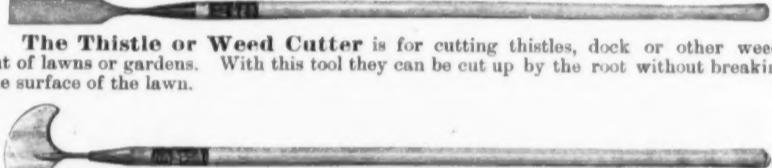
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# THE IRONMONGER

## METAL TRADES ADVERTISER

PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 42 CANNON STREET, LONDON, E. C.

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We guarantee "the Best Fires from the Worst Coal, and absolutely no cleaning."

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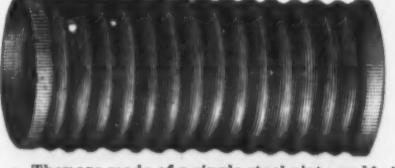


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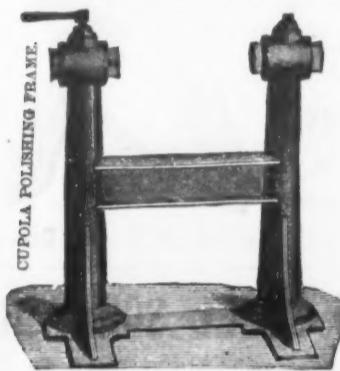
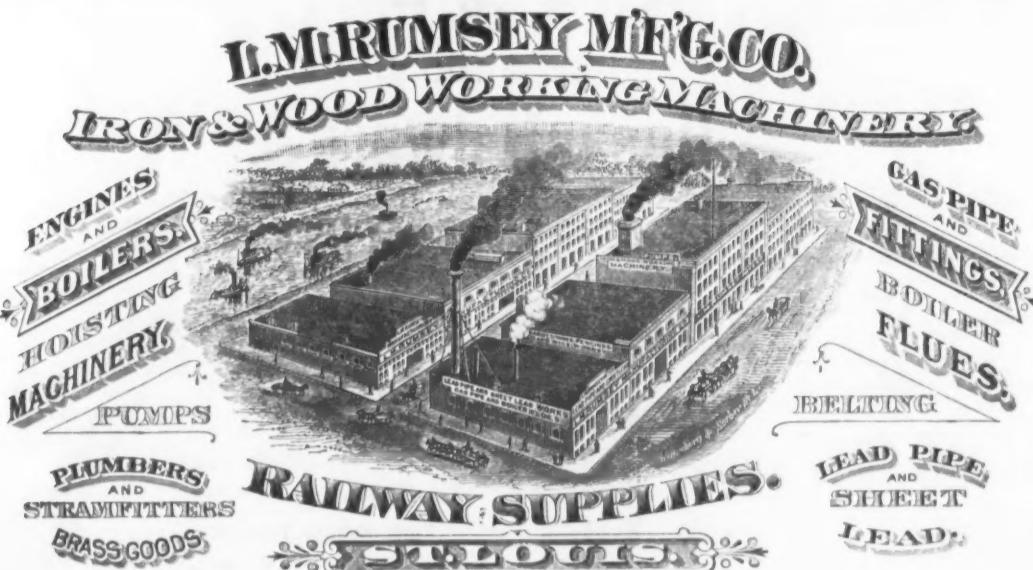
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No. 1 Carries 7 feet earth.  
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A represents the Stationary Locking Bar; B, the Self-Locking Adjusting Block; C the Operating Rod; D the Lower Bracket; E the Lifting Arm; F the Transom Bracket.

With this Adjustable Locking Bar and Lifting Arm, the opening of the transom can be made larger or smaller without the least inconvenience.

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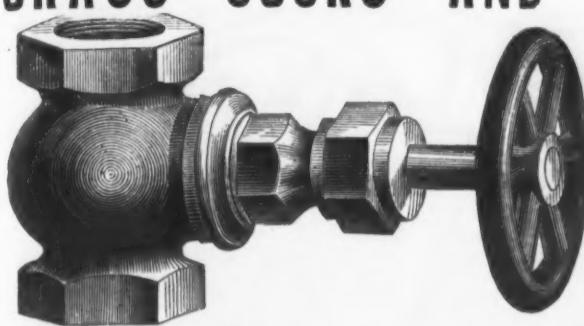
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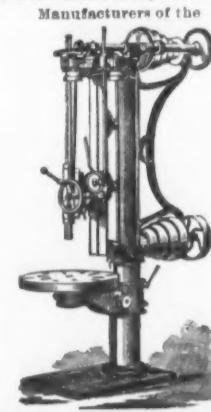
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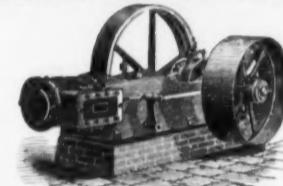
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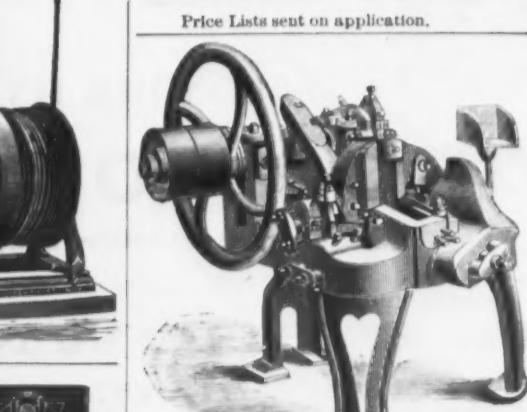
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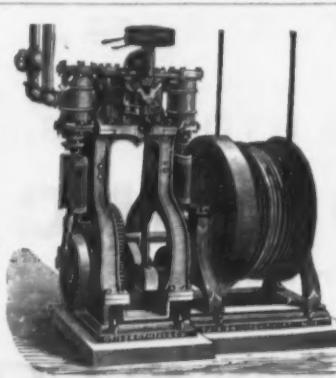
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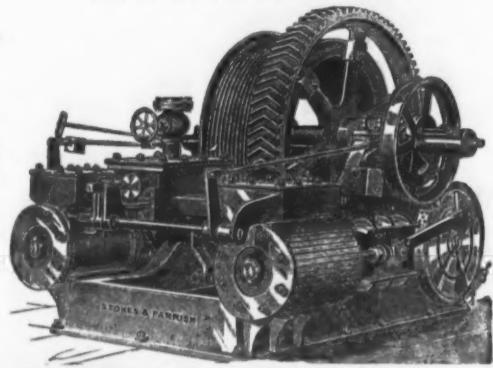
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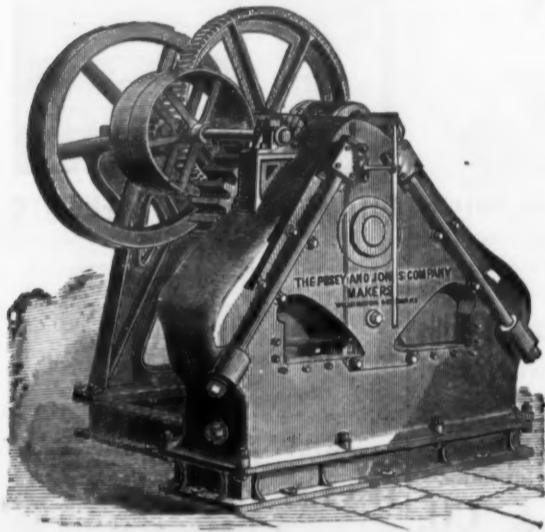
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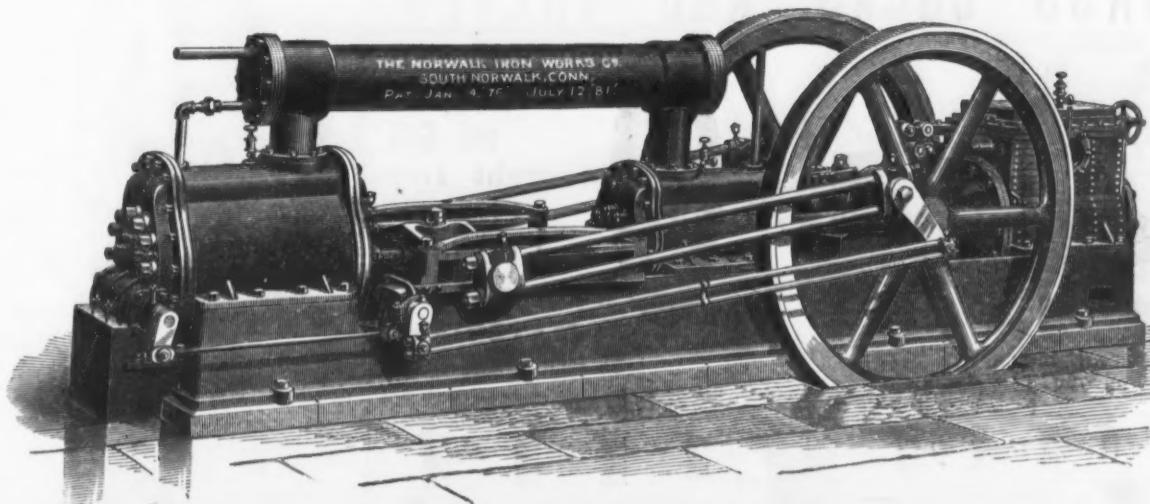
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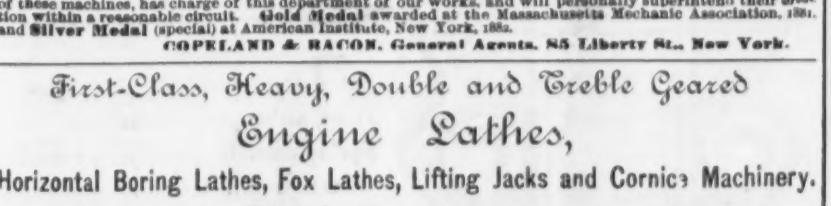
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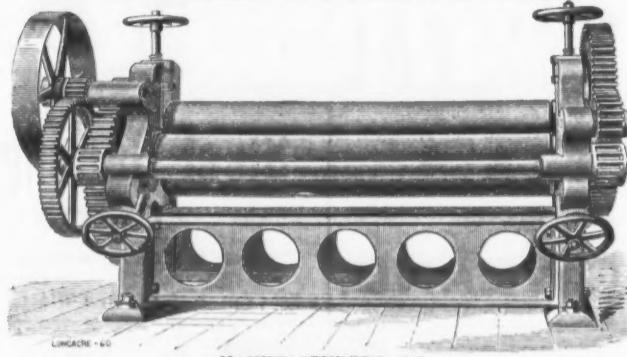
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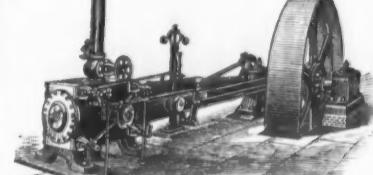
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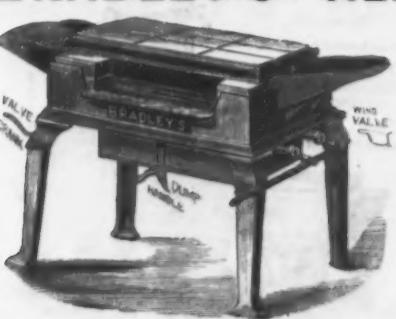
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